The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Contents

Volume 48 Number 5

MAY, 1941

(Index to Advertisements . . . Page 670)

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Published monthly, except twice in October, and entered as 2nd class matter Dec. 22, 1934, at the Post Office at New Haven, Conn., under the Act of March 3, 1879. Subscription, Domestic, $3 a year; Canadian and foreign, $4. Single copies, 35 cents. Copyrighted, 1939, by Trade and Technical Papers, Inc., 522 Fifth Avenue, New York, N. Y., Murray Hill 2-7888; Chicago: 309 W. Jackson Blvd., Harrison 7890—Bruce Knapp; San Francisco: Don Harway & Co., 420 Market St.; Los Angeles: Don Harway & Co., 318 W. 9th St.; London: 2 Cockspur St., S. W. 1, Whitehall 6642—Donald Hunter.

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Editorial

Feature Articles

New Chemicals for Industry

Plant Operation and Management

Chemical Specialties

News of the Month in Review

Part 2: Statistical and Technical Data Section

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The Reader Writes—

Original Sources

Since you write about further improvements of your very useful Guidebook I would like to offer the following suggestion:

It would be of great interest to a very large percentage of your readers if you would indicate the chief original raw material from which the various chemicals are made, i.e., under each heading of a chemical show the basic raw material: such as toluol made from coal.

WILLIAM RIES,
New York, N. Y.

Standardized Literature

We wish to commend the suggestions of Mr. Werner Baumeister relative to "Standardized Chemical Literature." Also it is pleasing to note that CHEMICAL INDUSTRIES has taken an editorial interest in the subject. It is hoped that you will continue to prosecute the ideas, as it would be very helpful to be able to file trade information and data pertaining to equipment and supplies.

L. CARLTON MERTZ, President,
L. Carlton Mertz Co.,
Chicago, Ill.

Editorial Note: Chemical Industries is asking for expressions of opinion from leading trade organizations, and from private individuals and hopes to be able to publish at least a portion of the replies in the June issue.

Value of Statistical Section

I find the data section of your magazine extremely helpful, and personally, I would hate to see this feature discontinued since it does give in a clear, concise way, quite a bit of information that is very valuable, not only from the standpoint of the present, but as future reference.

OMAR SANDERS, Sec.-Treas.,
Fertilizer Industries, Inc.,
New York, N. Y.

Editorial Note: Reader Sanders need not fear that this feature of "C. I." will be discontinued. From time to time we will endeavor to increase its usefulness. We would like, for example, to follow the suggestion of J. W. M. Scott, Manager, P. W. Martin Gordon Clays, Inc., Gordon, Ga., and others to print the patent references in larger type.

The Story of Carnauba

During the latter part of 1940, there appeared in CHEMICAL INDUSTRIES an article in two installments entitled "Carnauba Wax—From Plantation to Industry."

This article proved very interesting and when we requested additional copies you very kindly forwarded to us a reprint of the two installments in one booklet.

If these are still available, we would very much appreciate receiving at least one additional booklet.

E. J. AUTHORSON,
L. H. Butcher Company,
Los Angeles, Calif.

Editorial Note: This article was a particularly interesting one to a great many readers as evidenced by the many requests for reprints. A few are still available to those who care to have one.

Are You Interested in Exporting?

Two subscribers in the past month have suggested to this Department the publication of the names of manufacturers who are interested in exporting chemicals. One, Materias Primas Industriales, S. de R. L., Mexico, writes: "We suggest that you include a list of concerns looking for representatives in Latin America and vice-versa."

Editorial Note: We suggest that all foreign concerns hoping to make connections with American manufacturers communicate with the Bureau of Foreign and Domestic Commerce, Chemical Division, Washington, D. C. Any United States firms wishing the complete addresses of these two firms please communicate with this Department.

Coming Features

"By Products of the Pulp and Paper Industry" by Guy C. Howard of Marathon Chemical will be the next article in the "Wealth from Waste" Series and will appear in the June issue.

"Metals and Alloys and National Defense" by Bruce W. Gonser of Battelle Memorial Institute.

"Plastics in Defense" by T. S. Carswell of Monsanto Chemical Company.

"Powder Metallurgy" by Walter J. Baëza of Industrial Research Company.

"Formulation of Bubble Baths" by Lawrence D. Gibson of Cunningham Cleanser Corporation.

CALENDAR OF EVENTS

May

May 12-13, Society of Automotive Engineers, Production Meeting, Schroeder Hotel, Milwaukee, Wisc.
May 12-14, Scientific Apparatus Makers of America, Annual Meeting, White Sulphur Springs.
May 13, Detroit Paint, Varnish & Lacquer Production Club, Regular Monthly Meeting, Lee Plaza Hotel, Detroit, Mich.
May 15, Chicago Paint, Varnish & Lacquer Assoc., Annual Meeting and Dinner.
May 15, New England Paint & Varnish Production Club, Regular Monthly Meeting, Hotel Vendome, Boston, Mass.
May 18-22, National Electrical Wholesalers Association, The Homestead, Hot Springs, Va.
May 19-21, American Gas Association, Production and Chemical Conference, New York City.
May 19-21, Institute of Chemical Engineers, 33rd Semi-Annual Meeting, Edgewater Beach Hotel, Chicago, Ill.
May 19-22, American Petroleum Institute, 11th Mid-Year Meeting, Mayo Hotel, Tulsa, Okla.
May 19-23, American Association of Cereal Chemists, Convention, Fontenelle Hotel, Omaha, Neb.
May 19-23, American Society for Metals, Western Metal Congress—Western Metal Exposition, Los Angeles, Calif.
May 19-23, American Petroleum Institute, 11th Mid-Year Meeting, Tulsa, Okla.
May 23-27, Westinghouse Agent-Jobbers Association, The Homestead, Hot Springs, Va.
May 26-29, National Association Purchasing Agents, 26th Annual International Convention, Stevens Hotel, Chicago, Ill.
May 27-29, The American Society of Refrigerating Engineers, 28th Spring Meeting, Hotel Gibson, Cincinnati, O.
May 27, Chemists' Club golf day, Bonnie Briar Country Club, Westchester, N Y.
May 29-31, National Oil Scouts & Landmen's Assn., Dallas, Texas.

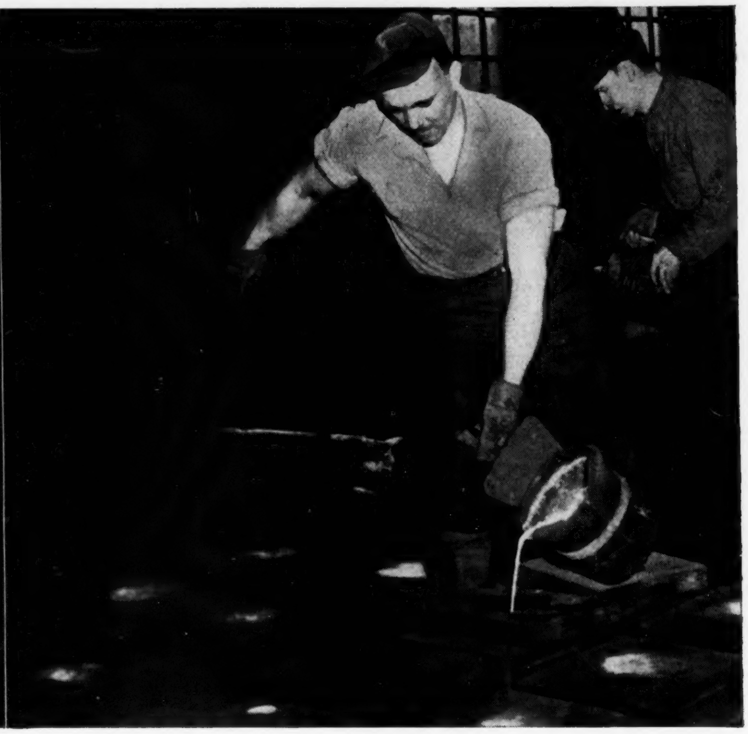
June

June 1-6, Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va.
June 4-6, Synthetic Organic Chemical Manufacturers Association, June Outing, Sky Top Lodge, Pa.
June 5, Indianapolis Paint, Varnish & Lacquer Assoc., Meeting and golf, Country Club, Indianapolis, Ind.
June 7, Illinois-Indiana Petroleum Assn., 9th Annual Petroleum Conference, Robinson, Ill.
June 7, New York Section, American Chemical Society Annual Outing.
June 9-10, National Association of Insecticide and Disinfectant Manufacturers, Inc., Mid-Summer Meeting, Hotel Edgewater Beach, Chicago, Ill.
June 9-10, Texas Cottonseed Crushers' Assn., Annual Convention, Galveston, Texas.
June 10, Salesmen's Association Golf Tournament, Wingfoot Country Club, Westchester, N. Y.
June 9-11, The National Fertilizer Association, 17th Annual Convention, White Sulphur Springs, W. Va.
June 10, Detroit Paint, Varnish & Lacquer Production Club, Regular Meeting, Lee Plaza Hotel, Detroit, Mich.
June 14, Detroit Paint, Varnish & Lacquer Production Club, Annual Picnic, Kingsville, Ontario, Canada.
June 16-20, The American Society of Mechanical Engineers, Semi-Annual Meeting, Kansas City, Mo.
June 19-20, Pennsylvania Grade Crude Oil Assn., Annual Meeting, Bradford, Pa.
June 22-26, American Water Works Association, Royal York Hotel, Toronto, Canada.
June 23-25, The American Leather Chemists Association Annual Meeting, The Sagamore, Balton Landing on Lake George, New York.
June 23-27, American Society of Testing Materials, Annual Meeting, Palmer House, Chicago, Ill.
Wk. June 22, American Pharmaceutical Manufacturers' Associaion Annual Meeting, New Ocean House, Swampscott, Mass.
June 23-27, American Society for Testing Materials, Annual Meeting and Exhibit of Testing Apparatus and Related Equipment, Chicago, Ill.

July

July 23-25, American Society of Civil Engineers, Annual Convention, San Diego, Calif.

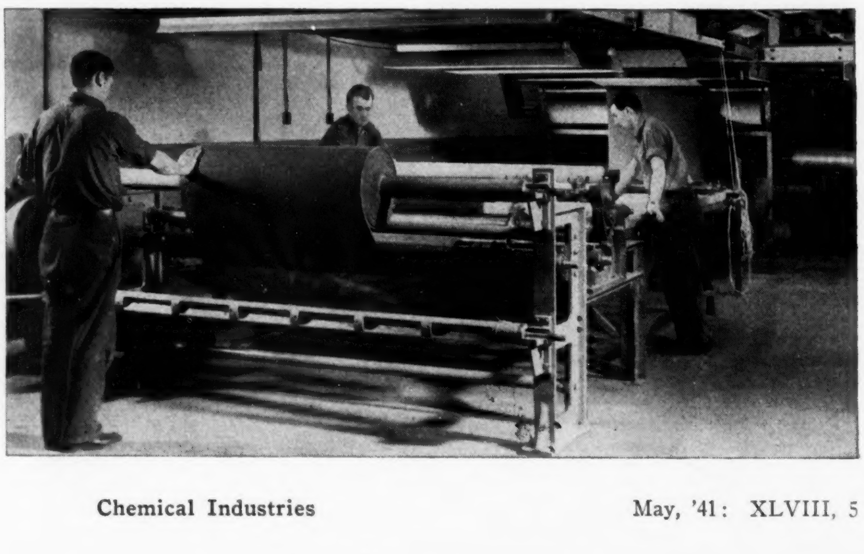
LIFE ON THE

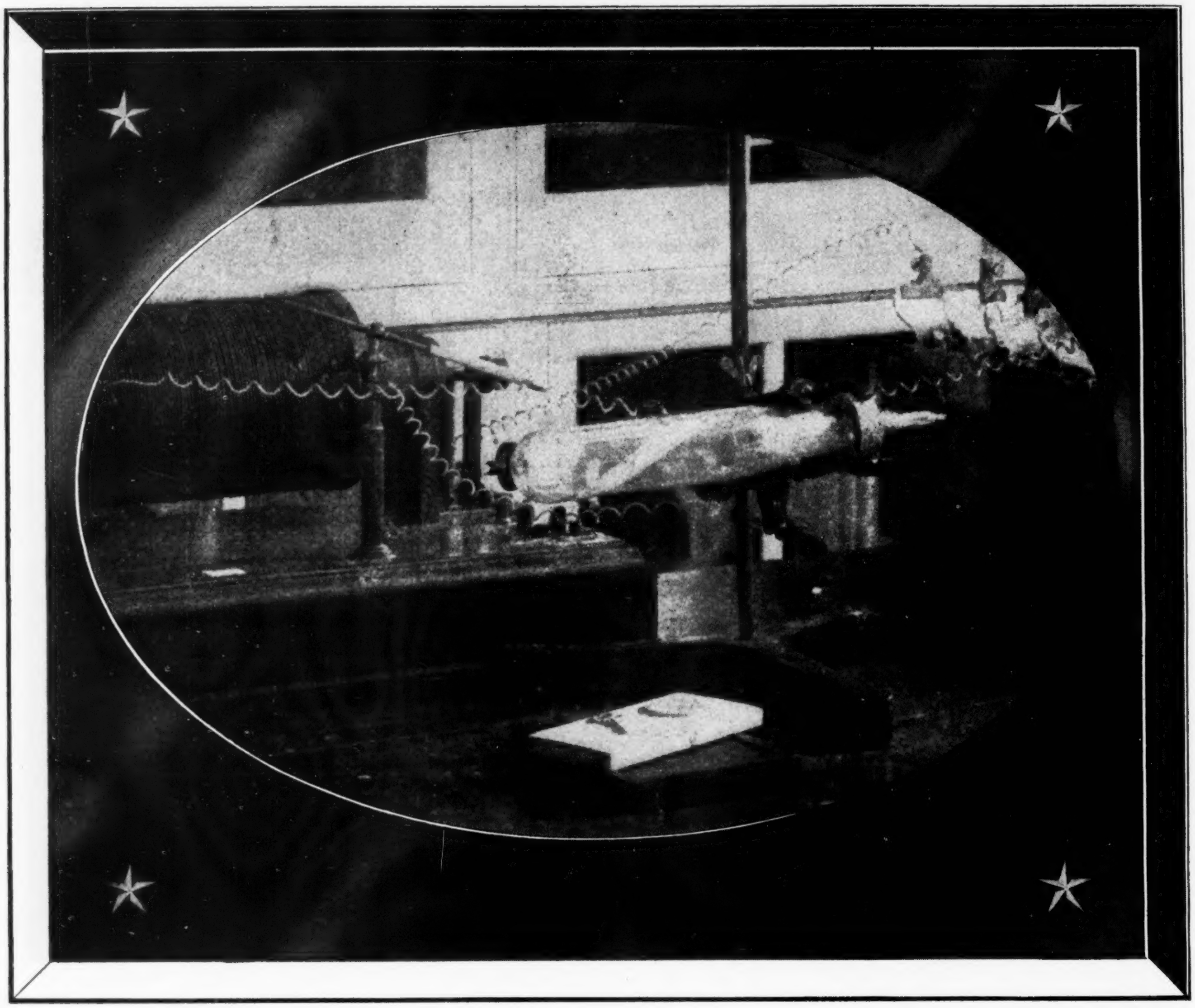


(*Above*) **FROM BOTTLE WASHING TO FOUNDRY WORK,** many jobs are now accomplished better, more easily and more economically by the utilization of AEROSOL* Wetting Agents. Bottling companies find that small amounts of powerful AEROSOL OT in the rinse solution practically eliminate carry-over of labels and dirt. Foundry practice too has been improved by the use of AEROSOL. Small quantities added to Bentonite or foundry sand speed the wetting or mixing operation. And as emulsifying agent for foundry core oils, AEROSOL saves about 25 percent in quantity and cost of oil. Cyanamid's AEROSOL OT is the most powerful wetting agent commercially available for a wide range of industrial processes. A booklet describing its many uses and advantages is available on request.

(*Above*) **"FLOTATION" MILLING OF WHEAT** removes the splintery husk yet preserves the full nutritive elements of the grain. This new process, demonstrated by its inventor, Theodore Earle, makes possible a bread reported to be as nourishing as whole wheat but fine and smooth as white bread. As consumers gain by improved milling processes, so does the milling industry benefit by Cyanamid's Liquid HCN, the highly effective and efficient industrial fumigant.

(*Below*) **CARPETS WITHOUT WEAVING**—now being produced by anchoring fibers in sponge rubber—are said to be unusually luxurious underfoot and long-wearing. Many Cyanamid chemicals aid in making better products in the textile and floor-covering industries.





They Started Something!

THE DISCOVERY of the X-ray with its amazing properties opened a new era in medical science and in industrial progress. It made possible striking contributions to human welfare, through its use in studying bone fractures, examining tissues and organs, and treating diseases.

Industry soon found in the X-ray a tool of even greater utility both for the inspection of products and for the uncovering of new basic knowledge of materials. The examinations of castings and welds to detect the presence of hidden defects; the study of internal stresses in rapidly moving objects; the development of the entire field of diffraction analysis, which has cast new light on physical and chemical changes in a wide variety of materials: these are among the advances made possible in industry by the utilization of the X-ray.

When the engineers of EBG first made Liquid Chlorine commercially available in America, they, too, made striking contributions to human health and to industrial progress. Municipalities found in EBG Liquid Chlorine a highly effective means of preventing the spread of water-borne diseases, through its use in purifying water supplies. Today EBG Liquid Chlorine is constantly expanding its utility in the newer field of sewage sterilization. And in industry, the use of EBG Liquid Chlorine as a bleaching agent enabled the manufacturers of paper and textiles to set new standards of efficiency, quality, and economy in their manufacturing processes.

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CHEMICAL INDUSTRIES
The Chemical Business Magazine
Established 1914

Fiddling While Democracy Burns

AMERICAN citizens in increasingly greater numbers are registering with Congress their complete disgust with the present vacillating, shilly-shallying attitude of the Administration on the strike problem and among the most voluble are many who make up the rank and file of labor. One burly, brusk, middle-aged mechanic in a mid-west chemical plant, himself a veteran of World War I, expressed his views to the writer just two weeks ago in the following words:—

"When they take my boy in the army I expect that they will supply him quickly with fighting equipment, plenty of equipment. Otherwise, it's just plain murder."

Statistics now clearly indicate what strikes are doing to defense. The New York Times' index of business activity showed the sharpest decline in the week ended April 19 that it has registered since April a year ago and reached the lowest level reported in 1941. Indices of business activity will all show declines in a month when wide gains should occur naturally. A large part of this unnecessary loss in production is the result of the strike in the soft coal industry. On April 1 some 400,000 miners, responsible for 85 per cent of the nation's soft coal output, laid down their tools. On April 26 President Roosevelt cancelled a trip to Warm Springs to be ready to act unless an accord was reached on the following Monday!

In that period production was set back an estimated 30,000,000 tons, and the War Department is authority for the statement that the shortage caused a drastic curtailment in the production of steel, textiles, chemicals and other things needed for defense.

What is the cause of the strikes that suddenly are paralyzing industry? Are labor leaders battling for an eight-hour day or the right of collective bargaining? Are they seeking to gain higher wages to offset higher living costs? The first two objectives labor has enjoyed now for some years. Certainly government statistics do not support the third.

Since September, 1939, hourly wages have risen nearly six per cent and weekly wages more than 12 per cent, while in the same period the rise in the cost of living has advanced but two per cent. Employment in the past 18 months has risen nearly 20 per cent and factory payrolls approximately 40 per cent. Hourly wage rates are nearly 30 per cent higher now than they were in 1929, and when due consideration is given to the fact that the average hours worked are 17 per cent lower, then weekly wages are up seven per cent over the prosperous 1929 era. Nor is this all the story for the cost of living is 14 per cent below 1929 so that the purchasing value of the weekly factory wage is up 25 per cent.

Much of the unrest is foreign inspired. Much of it is being caused by unscrupulous labor leaders. Much of it has had its origin in the promises of false prophets. True friends of labor and responsible labor leaders are alarmed for they know that what is now going on can't continue indefinitely and that when industry is conscripted the labor movement is likewise liquidated.

Clearly on the record the complicated machinery which has been set up to improve the labor situation has failed miserably. Mediation officials dashing feverishly from one plant to another can well be likened to the quack medical practitioner who prescribes a soothing but really worthless salve to various parts of a body badly afflicted by an internal malignant ulcer.

Possibly the bottleneck is the sea-shell-collecting Secretary of Labor, but whatever the reason or reasons are it is now high time to call an immediate halt to the scraping of fiddles while democracy burns.

Editorial

Standardization of Packaging: Manufacturers of chemical specialties cannot afford to view with indifference the proposed federal legislation designed to force the standardization of packaged goods. Only the Federal Food, Drug and Cosmetic Act can be compared for far-reaching effect with the measures which are to be sponsored by the National Conference on Weights and Measures Committee.

Last month at the American Management Association's Packaging Conference in Chicago, Alex Pisciotta, Director of Weights and Measures for the City of New York, explained to a slightly amazed audience of packaging men just what the proposed measure proposes to accomplish.

While the first standardization bill refers to the standard packaging of dry staple food products and the second to standardized packaging of edible oils, syrups, honey and molasses it is clear to see that if those who are sponsoring these measures are successful in having such measures passed the next goal will be to broaden the scope to include drugs, cosmetics and household chemical specialties.

In the dry staple food field the prescribed standard capacity weights are one-eighth pound, one-fourth pound, one-half pound, three-quarters of a pound, one and one-half pounds, and multiples of a pound. Proponents of the measure look with disfavor on odd sizes, odd weights and odd volumes. The shapes of packages are likely to be regulated. Even the sizes of the lips of containers will be carefully dictated.

The purpose advanced for such legislation by the advocates of the measure is to prevent deception of the consumer. No intelligent manufacturer seeks deliberately to mislead his customers. But needless to say there is more in this measure than meets the eye at first blush. What about packaging that is designed to have an "after-use?" What about packages that are particularly designed to aid in the application of the contents? What about packages that are particularly adopted for the "5 & 10" trade? What about packages containing materials to be mixed with other ingredients to produce a pre-determined quantity of finished material or dosages?

The proposal is fraught with many dangers to long-established merchandising practices. According to Mr. Pisciotta several conferences with industry are to be held in the next six weeks. Those interested should at least express their ideas as quickly as possible. Mr. Pisciotta's revolutionary proposals are digested in this issue in the report on the Chicago Packaging Conference.

Clearer Skies: After spending a week in St. Louis at the American Chemical Society Meeting it is easy to understand the justifiable pride the citizens of that delightful city now have in the operation of the new smoke ordinance. Not long ago St. Louis was quite famous or infamous for the pall of heavy smoke that effectively blotted out the downtown section except for very sunny days when high winds prevailed. The improvement is almost miraculous.

In view of this achievement it was quite fitting that the Symposium on Smokeless Fuels should be held there last month. According to W. L. Jones of the St. Louis County Gas Company and Dr. F. E. Vandeveer of the American Gas Association Testing Laboratories, it has been estimated that the annual bill for wastage of coal, gas and oil fuels due largely to incomplete combustion resulting in smoke and soot is $200,000,000. When cleaning of buildings, laundering or dry cleaning of wearing apparel and house furnishings, with resulting shortened life of such articles and similar items are considered, the total cost of smoke amounts to the startling sum of $2,500,000,000 annually and this sum does not include damage to health of individuals.

Still another factor was pointed out by R. R. Tucker, Commissioner of Smoke Regulation in St. Louis, and that is an appalling shrinkage in real estate values. St. Louis was certainly a classic example of this trend.

For several reasons low-temperature carbonization processes have not proved as successful in the past in this country as they have abroad. At least two such processes were discussed at the St. Louis meeting and they seem now to offer distinct possibilities. Widening markets for the byproducts attending the manufacture of low temperature coke, plus an increasingly greater smoke-conscious public may bring about several interesting introductions of low-temperature processes in the areas where soft coal is employed in large quantities.

Molybdenum In Industry: The use of molybdenum in the metallurgical field has long been established and that industry is thoroughly acquainted with its value as a "toughener" of cast iron and steel. Less generally known and appreciated are the chemical uses and Arthur Linz's article in this issue is of special timely interest at this period when tungstated toners are scarce and higher in price.

The largest single use of "moly" derivatives is in the dry color field, followed by the use of molybdenum as a catalyst in chemical operations. Molybdenum compounds are likely to find increasingly wider fields of industrial application. Climax Molybdenum Company has just announced the production in commercial quantities of anhydrous sodium molybdate ($Na2MoO_4$) adding still another product to the available list. One fairly recent development has been the application of molybdenum compounds in the processing of furs and hairs. One of the latest developments is the use of molybdenum compounds in conjunction with antimony compounds to impart high adherence to vitreous enamels on steels.

Other comparatively new uses are bright zinc plating and for the production of a black finish by electrodeposition, which, chemically, is mainly molybdenum sesquioxide.

The chemistry of molybdenum, of course, has been known for many years, but for example, the commercial application of molybdenum orange was not realized until 1930. One important reason for the expanding applications of molybdenum derivatives naturally is the gradual decline in prices—the usual pattern in the chemical field. Chemists in many fields should investigate the possibilities of molybdenum compounds for they certainly warrant close attention.

DOW

16A

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Formula	$CHBr_2.CHBr_2$	$CHBr_3$	CH_2Br_2	$CH_2Br.CH_2Br$	$CH_3.CHBr.CH_2Br$
Molecular Weight	345.7	252.8	173.8	187.9	201.9
Properties	Clear, colorless liquid with a mild, sweet odor.	Clear, colorless liquid with a sweet odor resembling that of chloroform.	Clear, colorless liquid with a characteristic sweet odor.	Clear, colorless liquid with a characteristic sweet odor.	Clear, colorless liquid with a sweet odor.
Sp. gr. at 25/25° C.	2.953	2.847	2.471	2.172	1.943
Boiling Point	119° C. at 15 mm. Hg	148.1° C.	95.6—97.4° C.	131.4° C.	139.6—142.6
Freezing Point	0° C.	4.8° C.	<-50° C.	9.3° C.	<-50° C.
Flash Point	none	none	none	none	none
Fire Point	none	none	none	none	none
Solubility at 25° C.					
Alcohol	∞	∞	∞ *	Soluble	Soluble
Carbon tetrachloride	∞	∞	∞	∞	∞
Ether	∞	∞	∞	∞	V. sol.
Water	V. sl. sol.	Sl. sol.	Sl. sol.	Sl. sol.	Sl. sol.

*Methanol

DOW

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Molybdenum Mo

By Arthur Linz

Chemical Engineer
Climax Molybdenum Co.

Molybdenum, toughener of cast iron and steel and a factor in the chemical and electrical industries, is essentially an American metal. We produce about 92 per cent of the world figure, use it in many ways. Here on these pages is a brief history of "moly" and its uses and a graphic chart of world production.

MOLYBDENUM obtained its name from the Greek word μόλυβδος meaning lead-like. Molybdenum sulfide, which is the state in which the element is mainly found in nature, greatly resembles both lead sulfide (galena) and graphite.

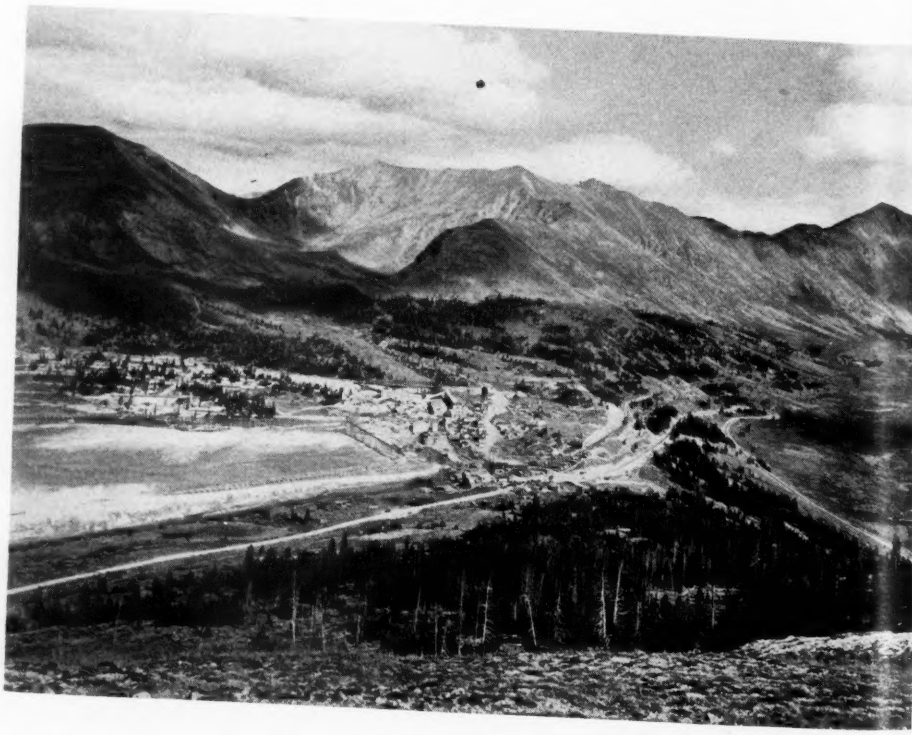
Whether the existence of the element was actually known in early Roman days is an open question. The assumption rests largely on the statements of Pliny, as quoted by Agricola in 1556. Pliny used the word "molybditis" quite frequently. Since this word was apparently used indiscriminately to describe any number of substances resembling lead sulfide, no one knows to this day just what mineral Pliny was talking about at any one time. The term was bandied back and forth down the ages, usually merely meaning "lead-like," to judge by the contexts. As late as 1730, one Alvarez Alfonse de Barba, "celebrated artist in the mines of Potozi," was using the term "molybdena" to designate a clinker from the bottom of a silver smelting furnace.

The first one to recognize that there was some fundamental difference between graphite and molybdena was Mr. A. F. Cronstedt, who, in his essays entitled "Systems of Mineralogy," published in Stockholm, Sweden, in 1758, first pointed out that there was a difference between "molybdena" and plumbago by stating: "It is of a lead color and does not strike fire with hard steel. When rubbed on white paper it leaves traces of dark brown or bluish color, as plumbago or black lead does; but they are rather of an argentine gloss, by which circumstance the molybdena may be easily distinguished from black lead as the traces made by this last are of a darker hue, less brilliant and of a deeper tinge."

Carl Wilhelm Scheele, a Swedish chemist, was the first one who recognized molybdenum as it is known today. He published an essay on "molybdaena" in 1778. Scheele's paper was translated into English and published by the London Scientific Society in 1787.

In 1790 there was published by the French Academy a correspondence between De M. Gadolin, Professor of Chemistry at Abo, Finland, and Mr. A. M. Berthollet, who describes the discovery of metallic molybdenum. In this document it is announced that Mr. Hielm produced the first metallic molybdenum. From then on numerous investigators confirmed Scheele's findings. It was not until the eminent Professor J. J. Berzelius, between the years 1818 to 1825, conducted the necessary experiments that the foundation of the chemistry of molybdenum was laid.

Below, "mountains of molybdenum," Climax Molybdenum's location near Leadville, Colorado, showing the company's extensive mining setup.



He established quantitatively the composition of molybdic acid and the methods of determination by using lead molybdate and, finally, the accepted atomic weight of molybdenum.

Neither Scheele, who discovered molybdenum, nor his contemporary, Hielm, who finally produced the pure metal in 1782, seem to have any idea of its commercial promise. In fact, its only recorded use for the first hundred years after its isolation was as a chemical reagent primarily in connection with the determination of phosphorous.

It is a mystery why molybdenum was not immediately tested metallurgically after the discovery in 1831 by Kote, who found it present in meteoric iron, since meteorites had been famous for centuries because of the superiority of the physical properties of their metal. It was actually not until the late decade of the nineteenth century that the possibilities of the use of molybdenum in steel were investigated. A sudden outburst of reports concerning molybdenum steels is evidence of this activity. Records indicate the earliest serious research in 1894. It was during this year that Blair improved chromium-tungsten steel by adding molybdenum. The same year the Creusot Works in France made an experimental ingot of molybdenum containing armor plate and

Above, molybdenum ore classifier shown in operation at the Climax Colorado mine. Left, molybdenum steel finds use in oil well drilling.

subsequently produced considerable quantities of molybdenum steel. Further reports followed in quick succession. The periodical "Stahl und Eisen" mentioned molybdenum as an alloying element in 1896. In the same year a heat of steel containing over 3% molybdenum was made in the then city of St. Petersburg. Its properties compared favorably with those of similarly made tungsten steel. Madame Curie, of radium fame, experimented with molybdenum steel magnets in 1898.

Molybdenum is essentially a twentieth century product. There is one nineteenth century record which apparently signalizes the first appearance of molybdenum steels in this country. This introduction was most unusual. In 1899 a French salesman called on the Carpenter Steel Company of Reading, Pennsylvania, with a sample of particularly high grade molybdenum containing tool steel. An order was obtained on the basis of its performance.

In a competition at the 1904 World's Fair in St. Louis the McInnes Steel Company of Corry, Pennsylvania, won the first prize with its "McInnes Extra," a molybdenum containing tool steel. This company had been producing the steel since 1902, so that even in 1904 molybdenum tool steel was an established product. From the earliest records up to 1918 the history of molybdenum steels in this country is largely one of continuous investigation, the practical results of which were few. This lethargy was due to the high price and also to the extremely uncertain source of supply of molybdenum. The discovery and development of the mine at Climax, Colorado, coupled with a temporary demand for the metal during World War I, gave matters a new impetus. The opening of such a large ore body not only assured a dependable supply, but resulted in a rapid decline in the price culminating in today's economical figure.

The cessation of the war temporarily left molybdenum without a market, but the experiences of steel fabricators with wartime molybdenum steels ensured its ready adoption for peacetime purposes. One of the first instances was the "all molybdenum steel automobile," the Wills St. Claire. The Hyatt Roller Bearing Company and The Studebaker Corporation standardized on molybdenum steels during 1921, after quickly determining that the steels had distinct economic advantages.

The widespread establishment of molybdenum steels was from then on merely a matter of time. Broadening recognition of their outstanding qualities could be expected to increase the use of molybdenum steels rapidly. And this is precisely what has occurred.

During recent years a great number of new molybdenum steels have been developed. Some are particularly suited for more or less specific applications—many are highly versatile.

Molybdenum's use in the steel industry is now widespread. The beneficial effects of molybdenum in steel arise from the influence the element has on the transformations which occur in ferrous alloys rather than from any cleaning or deoxidizing action. That is to say, the improved physical properties obtainable through molybdenum additions to steel are a result of its alloying effects rather than any part the element plays during the steel making process.

Molybdenum is added to steel in three forms:

1. as calcium molybdate containing 40 to 50% molybdenum;
2. as ferromolybdenum containing 50 to 65% molybdenum;
3. as molybdenum oxide in briquette form or canned.

Molybdenum is soluble in iron. It does not oxidize readily in the molten bath, assuring a high recovery. Molybdenum has a lower affinity for oxygen than does iron. The oxides of molybdenum in the molten bath are easily dissociated and reduced, and the molybdenum dissolves in the metal.

Ferromolybdenum is dissolved directly in the steel. No slag reactions are involved.

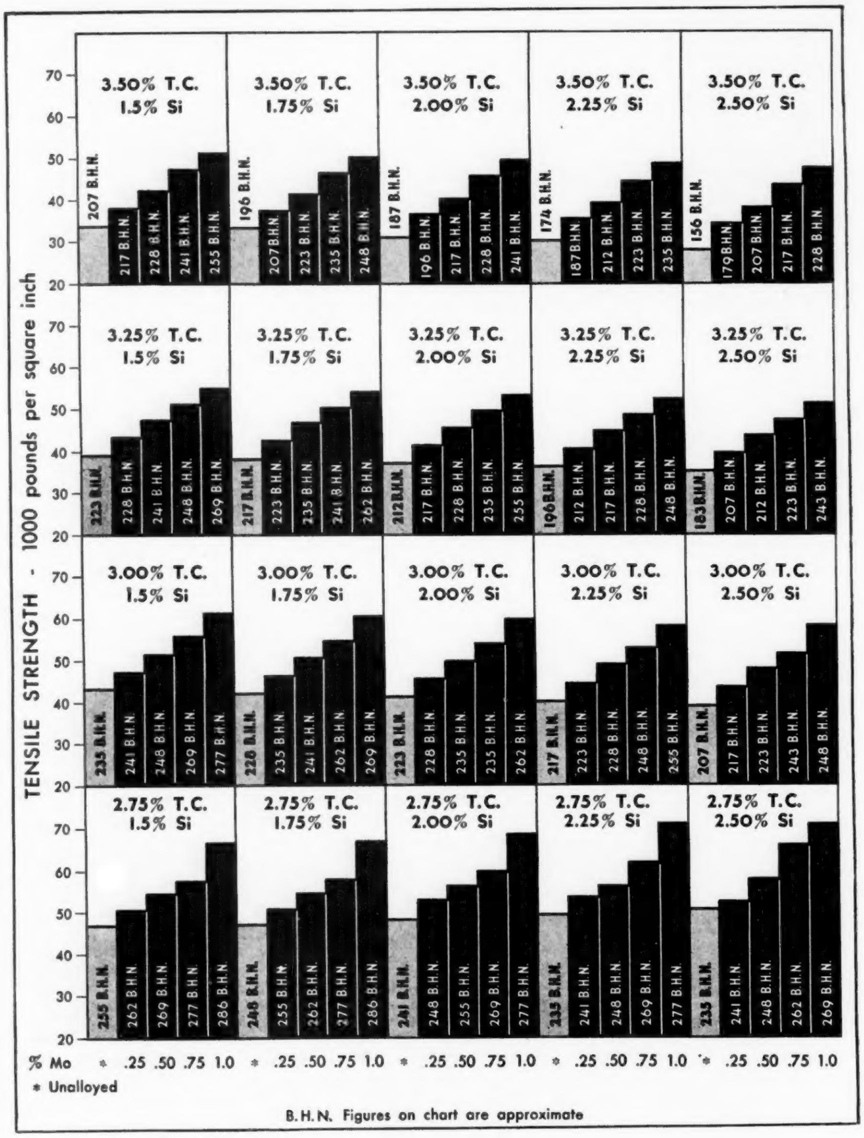


Figure 1

Molybdenum in Cast Iron

The practical and economic improvements brought about by the addition of molybdenum to cast iron are based primarily on its effect on the structure and physical properties of the metal. It is definitely known that molybdenum has a decided influence on the nature of the decomposition products of austenite which are formed as the iron cools in the mold. The net result of this effect on austenite decomposition is a strong refining action on the structure of the matrix.

Small and uniformly distributed graphite particles are characteristic of irons properly alloyed with molybdenum. This effect on the graphite is accompanied by the formation of a homogeneous structure in the matrix. Such a structure is better from the standpoint of both strength and machinability than the lamellar pearlite that is usually found in irons that do not contain molybdenum.

The metallurgical effects of molybdenum on cast iron can be summarized as follows:

1. Marked improvement in tensile and transverse strength, combined with higher deflection. (This holds particularly for castings of large section.)
2. Higher impact strength.
3. Greater fatigue strength.
4. Improved wear resistance.
5. Better toughness and strength at elevated temperatures.
6. Intensification of the effects of other alloying elements.

The effects of any alloying element on the properties of cast iron are naturally

dependent in a large measure on the quality of the base metal. Molybdenum is not recommended as a remedy for improper foundry practice, either in melting or casting. Given a good base iron and proper casting practice, full advantage can be taken of its effect on both the physical properties of iron and the economy of its production.

The toughness of molybdenum irons, together with their superior strength at elevated temperatures, reduces their susceptibility to cracking when they are subjected to sudden changes in temperature. Since molybdenum slows down phase changes at elevated temperatures, the irons have excellent resistance to growth. The superior toughness, fatigue strength and wear resistance that characterize molybdenum irons are largely due to their greater homogeneity of structure.

As a matter of fact the tensile strength of a good base iron can be raised as much as 50% by adding molybdenum. The proof rests in the experience of a growing number of American foundries that are producing 50,000 pound iron and better, consistently and economically. The results that can be obtained with different base irons are shown graphically by the charts (Figs. 1 and 2). The same chart shows the effect of molybdenum on hardness. The addition of molybdenum raises hardness less per unit of improved tensile strength than does the addition of any other alloying element.

Molybdenum in the Chemical Industry

Molybdenum has found a wide variety of uses in chemistry and its closely allied fields. This development is quite recent. In 1935 less than 100,000 pounds per annum of molybdenum were consumed in this field in the U. S. A. In 1940 about one-half million pounds were used.

At present the largest field of application is in the production of pigment colors for printing inks, lacquers, paints and other pigment consuming products. The principal pigments are the precipitated basic dyestuffs of the triphenylmethane series and molybdenum orange. The latter is a solid solution formed by coprecipitation of lead molybdate and lead chromate together with other slightly soluble lead salts. Molybdenum colors are noted for their permanence, brilliance and great tinting strength.

The first observation of the formation of molybdenum orange was in 1863, but it was not until 1930 that this product was introduced for commercial use. The precipitated dyes were first discovered in 1912, at which time it was found that both tungsten and molybdenum or combinations of the two produced desirable pigments. At that time molybdenum was so much higher in price than tungsten that colors with tungsten alone were produced and the pigments became known as "tungstated toners." As molybdenum is now considerably lower in cost than tungsten, molybdated toners are the economical choice.

This application is followed closely in volume by the use of molybdenum as a catalyst. Although there are a great many patents in this field which include molybdenum, very little information is available to show precisely how molybdenum is applied. At the present time it is used by the petroleum industry and is particularly valuable in the production of high grade gasoline.

Among the other uses are Bright Zinc Plating and for the production of a black finish by electrodeposition, commonly called Moly Black, which, chemically, is mainly molybdenum sesquioxide.

In ceramics, molybdenum is gradually coming into its own as an adherence promoting agent in connection with the glass enameling of steel and iron. The pale color of its compounds is of special interest in this field.

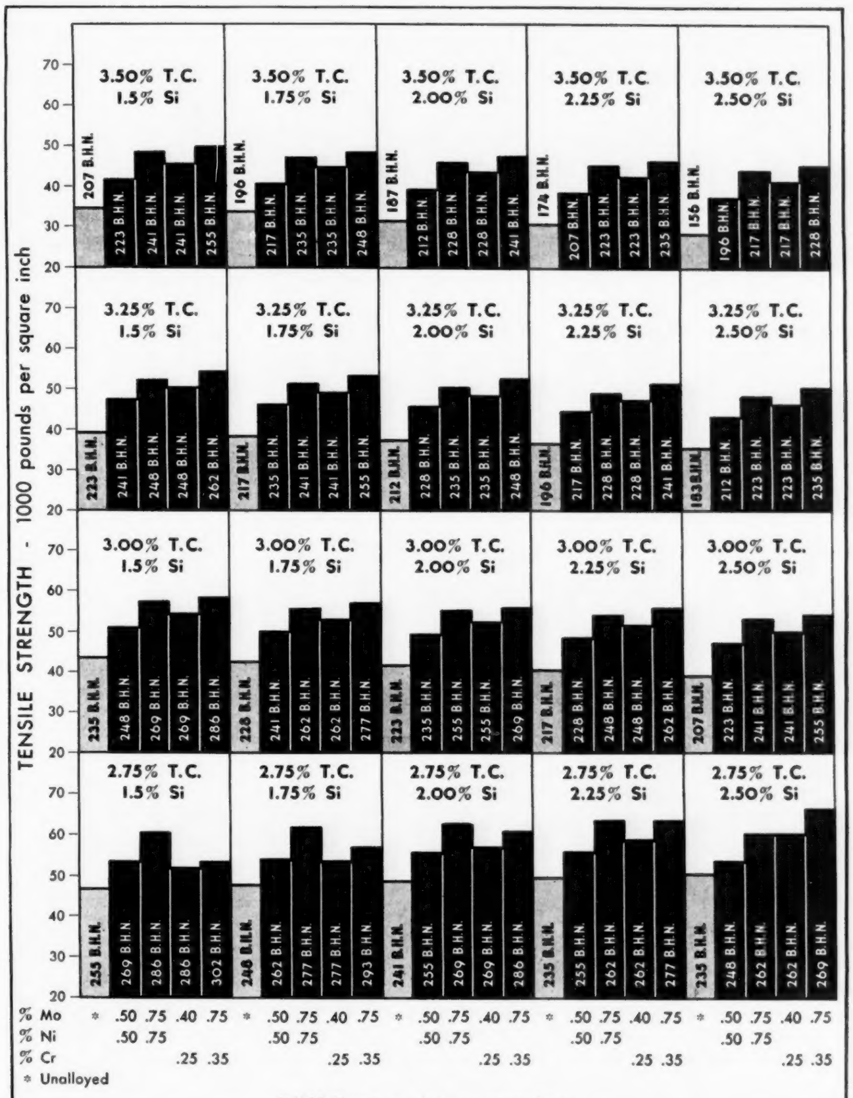
For dyeing furs it is used in conjunction with organic compounds to produce a variety of permanent colors.

Molybdenum in the Electrical Industry

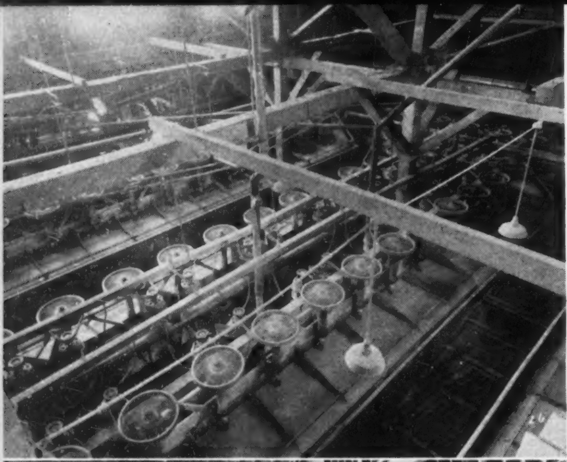
Metallic molybdenum is mainly produced in the form of wire, rods and sheets. Molybdenum has a very high melting temperature, over 2600° C., which makes it a very useful material where high temperatures are involved. For example, it may be used as a "heater winder" on hydrogen furnaces where its life is much longer than that of any other available material. It may also be used in providing leads or electrical connections through the walls of glass vessels or bars as it may be sealed directly to certain grades of hard glass.

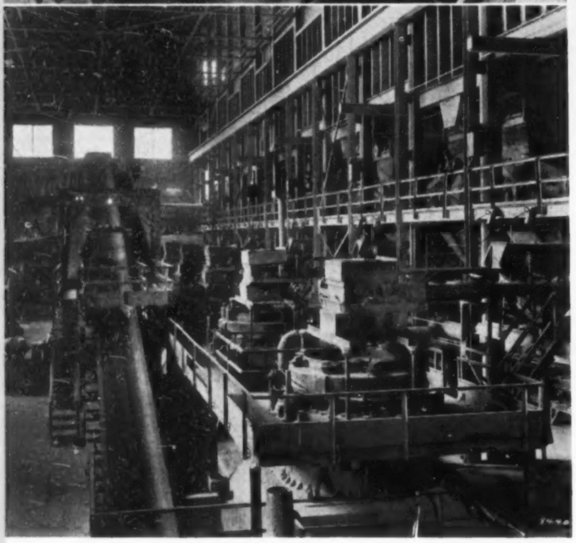
Molybdenum also possesses a distinctive characteristic in that it is quite ductile. Thus it makes a very convenient material to use in making "boats" or other shapes which may be used in handling materials which are to be heat treated in high temperature hydrogen furnaces. There is no deteriorating effect on molybdenum when

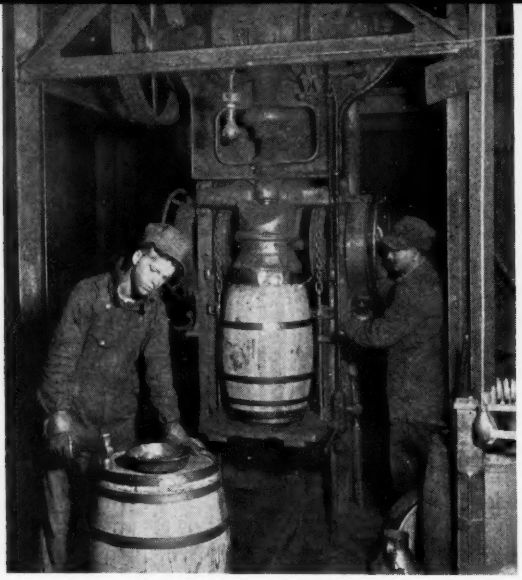
Figure 2



B. H. N. Figures on chart are approximate







Above, a scene in the packing plant of Climax Molybdenum and a scene showing the huge molybdenum warehouse.

Left, above, looking down on a battery of flotation cells. Below, the Climax Molybdenum's crusher house.

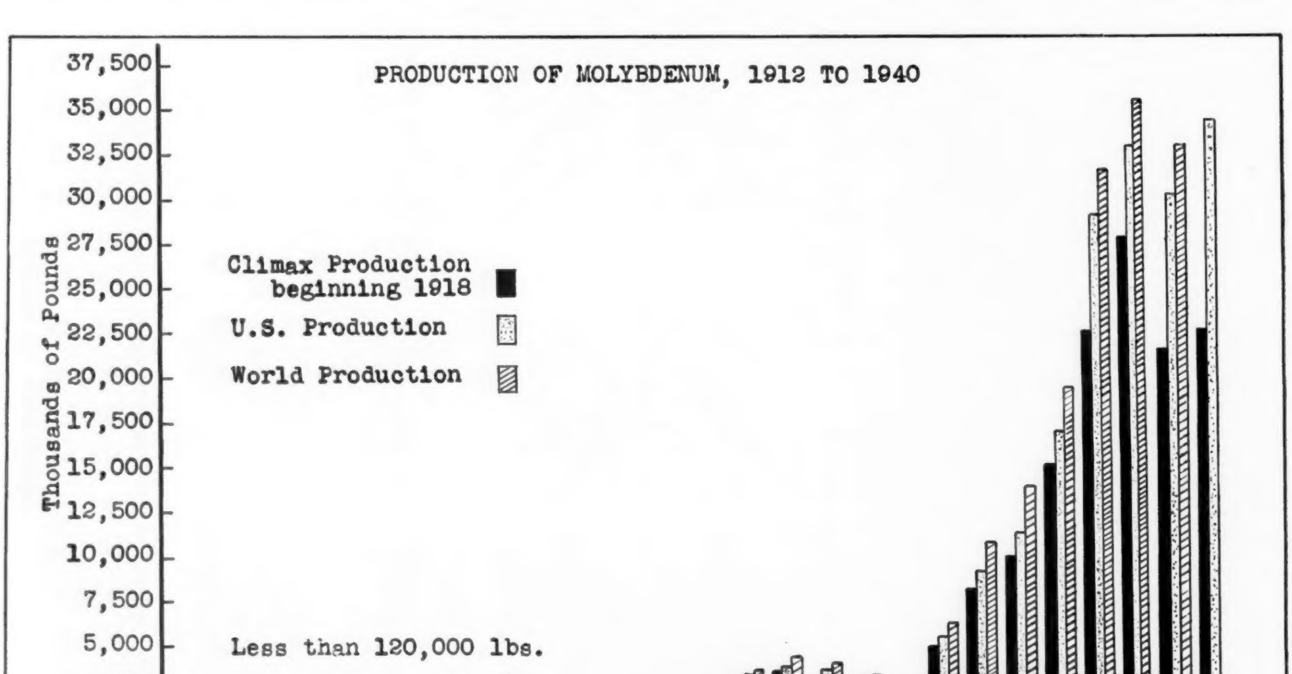
it is placed in hydrogen atmospheres at a temperature as high as 1200° C. Materials which are to be heat treated in a high temperature hydrogen furnace may be mounted on molybdenum mandrels, in which case the mandrels may be used over and over again.

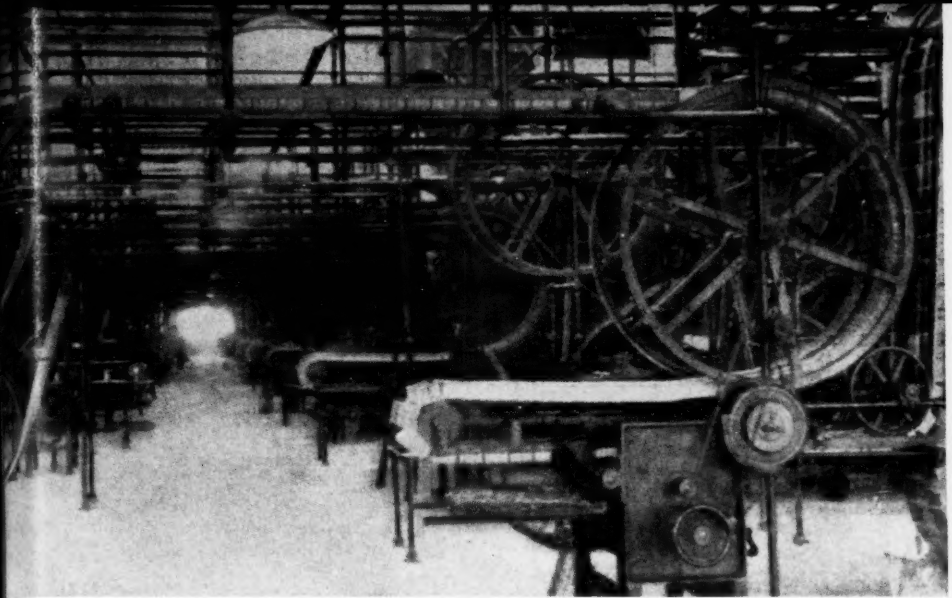
In addition to contacts of various types, one of the most important uses of metallic molybdenum is in the radio industry. Practically every receiving tube contains molybdenum. Although base metals and alloys are often substituted, not because of better performance but for economy, the annual consumption of molybdenum wire in electronic tubes may be measured in thousands of miles.

Molybdenum welds readily to other metals such as copper and nickel and, while it is not so easily welded to itself, the welding can be accomplished with reasonable care.

Molybdenum is essentially an American metal. The production of this metal has shown remarkable growth. In 1902 the United States production totaled approximately 1,500 pounds while world production was 90,000 pounds. By 1938 these figures had jumped to 33,297,000 pounds for the United States and 36,016,000 for the total world production.

The chart below gives a visual indication of the phenomenal growth of the molybdenum industry.





Manufacturing processes from preparing the glue solution to the methods of drying are features of M. F. Crass's second article on match making.

Above, drying room of match factory showing section of machines. Dipping tank for composition is shown in the foreground.

THE MATCH INDUSTRY

Part II - Manufacturing Operations

By M. F. Crass, Jr.

MATCH composition in most cases is manufactured in individual batches of approximately 21 gallons, and to meet the requirements of the larger producers it is necessary to prepare perhaps 200 of these batches in one working day. At least one manufacturer uses a larger batch method. This is of advantage in lowering labor and handling costs and probably results in better uniformity with less chance of error in preparation, due to the innumerable weighing operations necessary with the small batch method. The latter is still predominant, however, and has been used with but little change since the early days of the match industry. Copper or stainless steel batch kettles of approximately 22 gallons capacity are used.

The first step in the manufacturing process consists in preparing the glue solution. This may be done in several ways. Swelling of the dry glue in cold water for a period approaching 1½ hours, followed by melting or cooking in a hot water-bath, is the recommended method. The temperature of the melted glue is kept under 150° F, as excessively high temperatures tend to cause degradation of the glue with subsequent viscosity loss. Glue manufacturers insist that a prolonged swelling period prior to melting is essential for best results. Some match manufacturers dissolve their glue directly in hot water however, and dispense with the swelling period entirely. This simplifies operations, saves time, and reduces the number of kettles needed.

Other companies add the glue to cold water and by admitting steam to the water jacket of the mixing machine, gradually raise the temperature of the glue to the melting point. In this case, agitation of the glue solution is continuous while in the other methods, it is not. With the latter method both the swelling period and the necessity for jacketed melting tanks are eliminated, the total time required for the preliminary mixing of the complete batch being about one-half hour. With the first two methods outlined, mixing of the batch proceeds at a more rapid rate because the glue is already melted, one operating crew turning out about 8 batches per hour.

When the glue has been completely melted and heated to the requisite temperature, the kettle is withdrawn from the jacketed cooker and the glue allowed to cool to between 120° to 135° F, depending upon the temperatures of the room and the raw materials to be added. The glue kettle is then inserted in the mixing machine. This machine consists of a platform with a circular hole which accommodates the kettle, and a removable agitator shaft, so arranged that it can be inserted into place after the kettle has been placed in position. Agitation is then begun and the various ingredients added, together with sufficient water to adjust the viscosity to the required degree. The order of addition varies in different plants but is usually carried out in the following manner:

1. Starches, dextrines, and gums
2. Hot dye or color solution
3. Miscellaneous dry ingredients
4. Potassium chlorate
5. Phosphorus sesquisulfide
6. Potassium bichromate (if used).

Starch pastes and gums are added cold to the glue solution, the agitator being turned on and kept moving during the entire mixing operation.

The starch or dextrine is previously prepared the day before use so that it will be thick and cold when needed. Preparation is carried out in a large jacketed tank equipped with an agitator. The requisite amount of dry starch or dextrine is added to a measured volume of water in the tank, and thoroughly agitated to break up all lumps. The jacket contains water which is heated with live steam, the temperature during cooking thus being maintained at the boiling point of water. Several hours are required for preliminary cooking, and the batch is ready to be drained into small containers for cooling after a temperature

of 185° to 190° F has been maintained for a period of 20 minutes. For a 21 gallon batch of composition, about 3 gallons of starch paste is used.

Water soluble gums such as Karaya are prepared in large batches by the addition of the dry gum to water, followed by agitation until solution is complete and the gum has been dispersed in the water to form a thick viscous mucilage.

The colors are mixed in a small color can with the aid of boiling water and acetic acid, providing the dye is of basic character. If the color base is acid a small amount of soda ash is sometimes used in conjunction with boiling water for solution of the dye. The dry color is accurately weighed out on a small scale as needed, from 3 to 6 ounces being required for each 21 gallon batch of composition. The hot color solution is added to the glue-starch mixture during agitation of the latter.

The miscellaneous dry ingredients which have been previously weighed out into a cylindrical batch can are then slowly added, with the aid of a limited quantity of warm water. In some factories the batch cans are check-weighed after filling, in order to prevent omissions and off weights. Batch cans usually contain the inert materials, zinc oxide, varnish gums, rosin, and sulfur, each material being individually weighed out into the cans.

Next comes the potassium chlorate, which is well soaked with water in order to facilitate the breaking up of lumps and to prevent intermittent firing during the grinding operation.

Sesquisulfide, carefully weighed out on a scale used exclusively for that purpose, is then added with a small amount of water. Although difficult to wet, adequate grinding and mixing overcome the tendency of sesquisulfide to resist wetting and under ordinary conditions it is sufficiently well disseminated throughout the composition to produce good results. Use of a small amount of wetting agent in conjunction with the sesqui enables the operator to add it in the wet condition, which insures adequate dispersion under the most difficult of conditions.

When necessary for viscosity adjustment, addition of potassium bichromate is usually made in water solution although the finely powdered material is added directly to the batch by certain manufacturers. The solution method is preferred as it results in immediate reaction between the bichromate and the glue, and prevents lumps from forming which would lengthen the grinding time and possibly result in grainy composition.

After all of the ingredients have been added the batch is stirred for several minutes and additional water added, if necessary to reduce the viscosity. Excessively thick composition at this point is not desirable, as it prolongs grinding time.

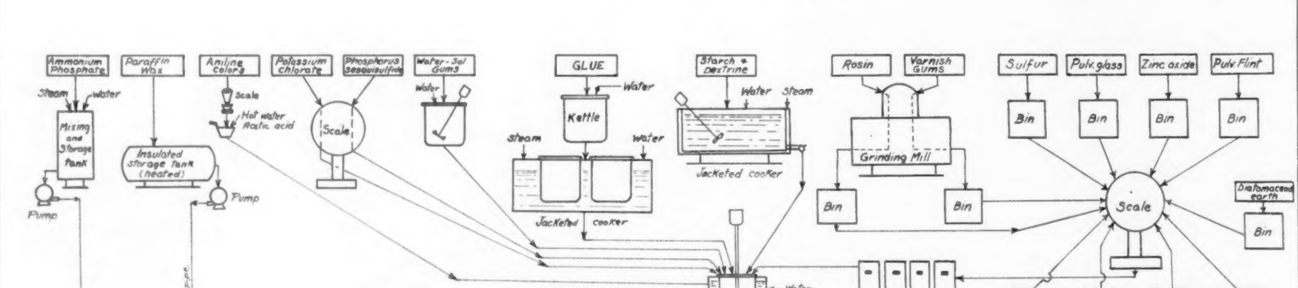
The batch is then transferred from the mixing kettle into a grinding mill. The mill is adjusted to insure adequate grinding, the time required being about one hour for the 21 gallon batch to pass through. The operation is not strictly a grinding process, inasmuch as the particle size of all insoluble ingredients prior to the mixing operation is about 80 percent through 140 mesh. The process insures adequate dispersion of ingredients, however, and breaks up all lumps and occluded materials.

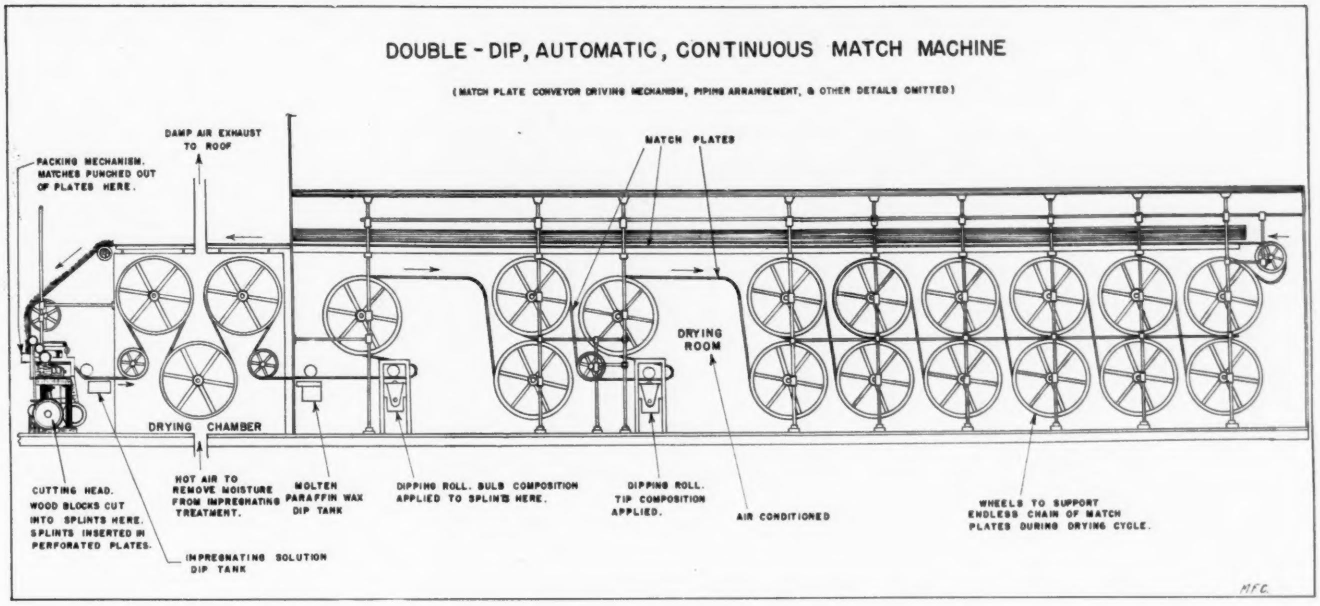
The grinding mill consists of a circular cone-shaped rotor which fits beneath a circular hopper or reservoir which holds the contents of one kettle. The grinding faces of both rotor and stator are of malleable iron, and are fluted in order to engage lumps of material. Tolerance between the grinding faces is about 1/64th inch. The composition is removed from the outer face of the rotor with the aid of a doctor and is collected in a clean kettle. As the level of composition in the grinding reservoir becomes lower, the sides are cleaned with the aid of a spatula and wet sponge, so as to prevent the accumulation of hardened composition which might otherwise take fire through accidental friction. Spilled composition is immediately cleaned up and kettles are washed just as soon as they are emptied.

The presence of hardened composition is scrupulously avoided throughout the entire plant. Composition making departments are provided with cement floors and brick walls, which are carefully cleaned with the aid of live steam and plenty of water following completion of the day's operations. Insurance requirements for match factories are very strict because of the hazardous nature of the product. Factories are therefore kept in a very neat and clean condition and are subject to frequent inspections by the underwriters.

Following the grinding operation the composition is again stirred for a period of 20 minutes to one-half hour, and then placed in storage for ultimate use at the match machines. During the various steps in its preparation, the temperature of the composition has been reduced so that it is between 90° and 95° F during the final stirring operation.

PREPARATION OF MATCH COMPOSITION





The larger companies provide a cool storage place with a temperature between 60° and 70° for finished composition. This is desirable because it prevents degradation of the glue, with resultant loss of viscosity and stability. Excessive heat spells ruin for match compositions. Bulb compositions are maintained at a temperature of about 95° F during use, and can be kept at this temperature for several hours without noticeable decomposition, due to the relatively low content of sesquisulfide. Tip compositions on the other hand, contain large amounts of the heat-sensitive sesqui and must be kept cool in order to prevent rapid decomposition. Such compositions are therefore applied at temperatures ranging between 70° and 75° F. Strike-on-box compositions contain no sesquisulfide and therefore may be maintained at higher temperatures if desired. In practice, however, they are handled similarly to bulb compositions.

Some manufacturers consider that a composition aging period of about 24 hours is desirable, and conduct their operations accordingly, the theory being that during this period small unbroken particles or granules of potassium chlorate will become wet and gradually break up, to be later disseminated throughout the composition during the final tempering operation. Undissolved chlorate granules are objectionable in finished match heads, as they result in flaring out of the flame, or "forking." During aging, the composition sets up to a semi-plastic gel, because of the decreased temperature. Cool storage conditions are essential if the composition is to be kept for a period in excess of 24 hours without degradation and appreciable loss of viscosity. Even at ordinary room temperatures, bacterial action upon the glue will become noticeable if the composition has aged 36 hours or more. With sufficiently low storage temperature, match composition may be kept for as long as one week without appreciable impairment of viscosity. Some manufacturers add preservatives to compositions that are subject to heat or long aging periods.

The final operation in the preparation of match composition consists of "tempering" or final adjustment of viscosity. The composition kettle is placed in a jacketed stirring machine and agitated, the temperature of the water in the jacket being increased by additions of live steam, until the temperature of the composition has attained the right degree. The experienced operator then adds small amounts of warm water or very dilute glue solution until the viscosity is adjusted to the correct value. Evaluation of viscosity is dependent upon the operator's judgment and experience, and considerable skill is required on his part. The tempering operation is an important one, faulty viscosities materially affecting both match machine operation and quality of finished product. Composition is used in the match machines immediately following the tempering operation.

Processing Operations

(*a*) *Wood splint matches*

In manufacturing a product that involves the handling, assembly, and packaging of millions of small units each working day, and to pay high taxes, operating, and administrative expenses when the selling price of such units range between 1/40th and 1/100th of a cent, it follows that the match industry must be geared to a high degree of mechanized efficiency if even a small profit is to be obtained. A typical wood splint machine operating at customary speed is capable of producing about one million matches per hour. The problem of assembling and packaging so many small units is taken care of by machinery, and in the larger and more modern factories the finished product goes out to the trade untouched by human hands.

As previously stated,[5] the modern continuous match machine has been changed but little in principle since its invention in 1888 by Ebenezer Beecher. Improvements were largely brought about by the efforts of engineers and designers employed by Diamond Match Co., and wood splint machines now in use are patterned after the Diamond machine. The machine may be used for either round or square splint matches and consists in part of a great number of perforated metal plates, usually of malleable iron, linked together at the ends to make an endless chain arrangement. There are usually 12 rows of perforations in each plate, each row containing 48 accurately spaced holes, making a total of 576 holes for each plate.

In the case of round splint matches, the splints are cut from blocks of selected white pine, free from knots and grain imperfections, by a series of razor-sharp hollow dies which are attached to a reciprocating cutting-head mechanism. The blocks are fed into the machine at a definite angle, depending in part upon both the width of the block and the number of hole perforations in the match plate. Splints are cut by the dies on the downstroke of the cutting head, the wood passing through the die and remaining fastened to it at the bottom end. On the upstroke of the cutting head the splints are forced into the plate perforations, the match plates passing directly over the cutting head, their movement being definitely synchronized to the reciprocating action of the machine. When it is considered that the modern machine operates at speeds sometimes in excess of 350 revolutions per minute, the extremely large production per unit can well be realized. One row of plate per-

forations is filled with splints for each upward movement of the cutting head. After the perforations have been filled with splints, the movement of the machine carries the plates, now bristling with splints over successive dipping operations and then over an extended series of wheels in order to dry the match heads.

The first dip in most plants consists of a very dilute, aqueous solution of ammonium phosphate, designed to prevent afterglow. Movement of the chain then carries the match splints through a drying chamber in order to drive off the surplus water. The hot splints emerging from the drying chamber are then dipped into a vat of molten paraffine wax, followed by application of the primary composition or "bulb," by means of a grooved roller which dips into a reservoir of the composition. A period of drying approximating 10 minutes comes next in the cycle, the plates passing up and down over a series of 3 or 4-foot wheels, two high, after which the splints receive the second application of composition. This application covers only the extreme tip of the match. The next step in the cycle involves an additional drying period, followed by application in some plants of treatment of the partially dry match heads with an aqueous solution of formaldehyde. An additional drying period then follows.

At the end of the cycle, which may require an hour from the time the plates were first filled with splints, they are returned to the head end of the machine where the matches are punched out of the plates and boxed. Modern machines do this automatically. Overall length of a match machine usually ranges between 90 and 100 feet, the chain containing as high as 1600 match plates.

In the case of square splint matches, a different technique is employed in that the wood cannot be fed directly to the match machine in block form. In place of white pine, aspen is generally used, the splints first being prepared by a peeling or veneering machine. Barked and trimmed aspen logs are fed into the machine where they revolve against a horizontal planing knife which acts upon the entire length of the log, the knife being adjusted to the thickness of the splint desired. Cutters placed above the planing knife divide the veneers into narrow bands whose width depends upon the length of the match splints. The bands are divided into convenient lengths and superimposed into piles of 50 or more, after which they are cut by a guillotine knife into square splints. The splints are then usually impregnated in a solution containing a fire retardant salt, dried, often cleaned and polished in a tumbling machine, straightened, and packed in trays for feeding. They are finally placed in a suitable hopper, jogged and pushed into match plate holes by automatic plunger devices, and proceed on their way through the dipping and drying cycle in similar manner to the round splint matches previously described. Use of square splint matches has been confined principally to the safety or strike-on-box variety which are packed in small cardboard or wooden boxes, the thin strips of wood for the latter being prepared on a veneer-cutting machine similar to that used for cutting the square splints. The vast majority of all wood splint matches are of the round stick variety, however, practically all of the strike-anywhere friction matches and a good percentage of the safety output being of this type.

Drying

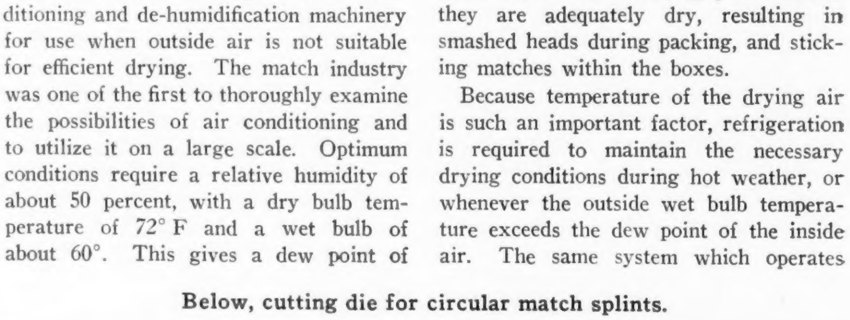
Efficient manufacturing methods require that the matches be sufficiently dry at the end of the machine cycle so that they can be properly packaged without danger of smashed or mis-shaped heads. At the same time, a high machine speed is essential for economical operation. Tied in with these factors is quality of product, inasmuch as the rate of composition drying has a definite bearing upon the properties of the finished match.

In order to definitely control drying conditions, it is necessary in the case of wood splint matches to house the drying operations in a specially constructed well-insulated room, and to provide air conditioning and de-humidification machinery for use when outside air is not suitable for efficient drying. The match industry was one of the first to thoroughly examine the possibilities of air conditioning and to utilize it on a large scale. Optimum conditions require a relative humidity of about 50 percent, with a dry bulb temperature of 72° F and a wet bulb of about 60°. This gives a dew point of 52°, the air containing 4.4 grains of water per cubic foot.

Air must be introduced into the drying room in a condition sufficiently below the dew point in order to absorb from 20 to 25 pounds of water per million matches per hour, and still contain after the absorption only 4 grains of moisture per cubic foot in order to maintain the 50 percent relative humidity. Maintenance of this humidity is essential. If it were lower, particularly with a rather high dry bulb temperature, drying of the match heads would be too rapid on the surface, thus upsetting the equilibrium of water vapor absorption from the head and allowing the surface to dry before the interior. Such matches when struck might explode with considerable violence, and scatter particles in all directions. Furthermore, the matches would sweat in the boxes, the surface again becoming wet after moisture equilibrium has been established, which would cause the dangerous condition of sticking matches within the boxes. Matches that are stuck together present a serious fire hazard, both during shipment, and when used in the home. If the relative humidity is too high the capacity of the air within the drying room for absorbing water vapor is lessened, and the matches will reach the end of the drying period before they are adequately dry, resulting in smashed heads during packing, and sticking matches within the boxes.

Because temperature of the drying air is such an important factor, refrigeration is required to maintain the necessary drying conditions during hot weather, or whenever the outside wet bulb temperature exceeds the dew point of the inside air. The same system which operates

Below, cutting die for circular match splints.



for conditioning and de-humidification in the summer may be used for cool weather operation as well, excepting that during cool weather it is not necessary to operate the de-humidifier or refrigeration system. During the winter the entering air usually has a much lower dew point than that required in the conditioned drying room and will act as the de-humidifier, and when mixed with returning air from the drying room carrying an excess of water vapor, will create satisfactory drying conditions without further treatment.

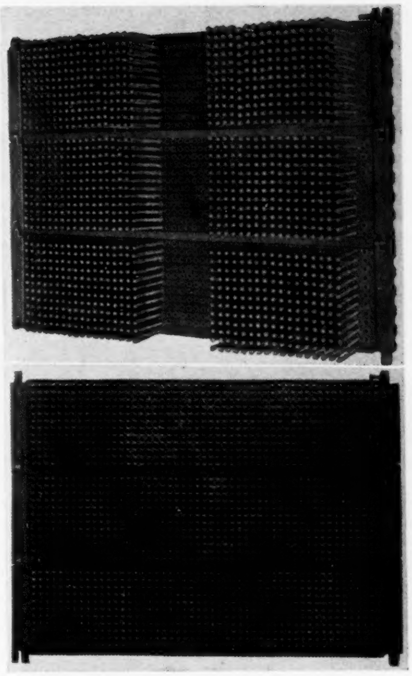
(*b*) *Book Matches.*

On Sept. 27, 1892, a patent was issued to Joshua Pusey[1] of Lima, Pa., for "flexible matches." These matches, the first of the popular "book match" type to be made, consisted of a series of cardboard strips tipped with an ignitible composition and attached to and enclosed by a suitable cover, folded and adapted to be opened and closed as the covers of a book. The cover was provided with a striking surface for igniting the matches. Pusey's first books were 3" by 2" in size, and contained about 50 match strips.

Although Pusey's patent related to both friction and safety matches, development of the book match followed the latter application almost exclusively, due to the danger of accidental ignition which existed when friction matches were assembled together in such a compact form.

Large scale production of this type of match began soon after 1900, when one firm secured a substantial contract which called for printed advertising on the covers of the books. The book match as it exists today is a principal medium for advertising, the matches being given away free of charge to purchasers of tobacco and to customers and clients of many distributing and servicing companies and organizations. Manufacturers of book matches must therefore be equipped with multi-color printing machines and must keep a large inventory of dies and printing plates on hand, due to the many hundreds of firms using the product for advertising purposes. Use of the book match has increased substantially during recent years, closely following the increase in cigarette consumption which has been so marked since 1918.

The modern book match folder comprises two strips of 10 splints each, each strip having a rear unsplinted portion, comb fashion, the splints being staggered and tipped with safety composition, and adapted to be torn off in succession and employed as matches. The cover is rectangular in shape, one of the narrow ends being doubled back over the unsplinted portion of the splint strip filler and stapled to the latter. The body of the paper cover extends around the heads of the splints to enclose them, and is then tucked in beneath the doubled-back attaching end previously mentioned.



Above, match plates, full and empty.

Although some of the book match manufacturing processes involve two or more integral steps, machines are now in use which perform all operations continuously, beginning with the feeding of the cardboard stock and ending with the rapid discharge of finished match books. The cardboard, of specially prepared type, and 3½" wide, is fed into the machine from large rolls. In most cases it is impregnated before use. In others, it is fed through an impregnating bath prior to further treatment. The board is then cut into 2 continuous strips 1¾" wide, each of which has one edge formed into continuous groups of staggered splints. The two splinted strips are then passed over a tank where they receive an application of paraffine wax, after which the strips are severed into convenient lengths and applied to suitable carrying bars which keep the individual splint ends separated during the application of ignitible composition and during drying. After being tipped with composition, the strips of matches are conducted into a heated drying chamber, where they travel over a series of wheels in an endless chain arrangement until the composition has dried to a sufficient degree.

The dried units are then automatically wrapped or enclosed in cover blanks and stapled in place. The covered units, usually comprising 12 completed match books, then receive an application of striking composition, and are cut into individual books, after which they are delivered to the packaging unit in staggered relationship in order to facilitate compact boxing.

A commercial formula which has been extensively used for book match composition follows:

Bulb glue	20 lbs.	4 oz.
Gum Tragacanth	2	0
Potassium chlorate ...	106	8
Lead hyposulfite	9	0
Sulfur	6	0
Diatomaceous earth ..	13	8
Rosin	1	2
Pulverized glass	24	12

(*c*) *Repeater Matches.*

Although not of commercial importance, the repeater match should be mentioned as an interesting novelty which made its appearance on store counters a few years ago, but met with little acceptance and was consequently dropped from further commercialization in most localities. Such a match, that could be lighted, blown out, and relighted time after time, has been the source of a great deal of experimentation and has resulted in a number of patents.

A match of this type patented[2] in 1912 consisted of a metallic tube provided with a longtitudinal slit extending through the outer circumference of the tube along its entire length, and filled with ignitible composition. Insertion of a pin point or knife tip through the slit would force a sufficient length of composition out of the tube, which could then be lighted in the usual way.

A composition molded in stick form which, it was claimed, could be ignited, blown out, and re-ignited, was patented[3] in 1933, the ingredients being nitrocellulose, camphor, chlorate, potassium bromate, sulfur, ammonium oxalate, zinc oxide, and pulverized glass. A recent patent[4] (1935) describes a repeatedly ignitible match comprised of two parts, an internal core of active ingredients, and an outer shell or base which is easily ignitible, it being claimed that the latter base has the property of burning at a slow rate and polymerizing or vaporizing without leaving any residual ash. The inner longtitudinal core completely surrounded by the base consists of active substances designed to insure ignition upon a prepared surface, being made up of a mixture of red phosphorus, antimony sulfide, powdered glass, metaldehyde, sandarac, and cellulose acetate, the whole being dissolved in acetone. The outer base or shell consists of metaldehyde bound in an acetone solution of celluloid.

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2. *Swedish Match Co., U. S. Patent No. 1,019,756 (March 12, 1912).*
3. *Ringer, U. S. Patent No. 1,903,838 (April 18, 1933).*
4. *Swedish Match Co., U. S. Patent No. 2,015,383 (Sept. 24, 1935).*
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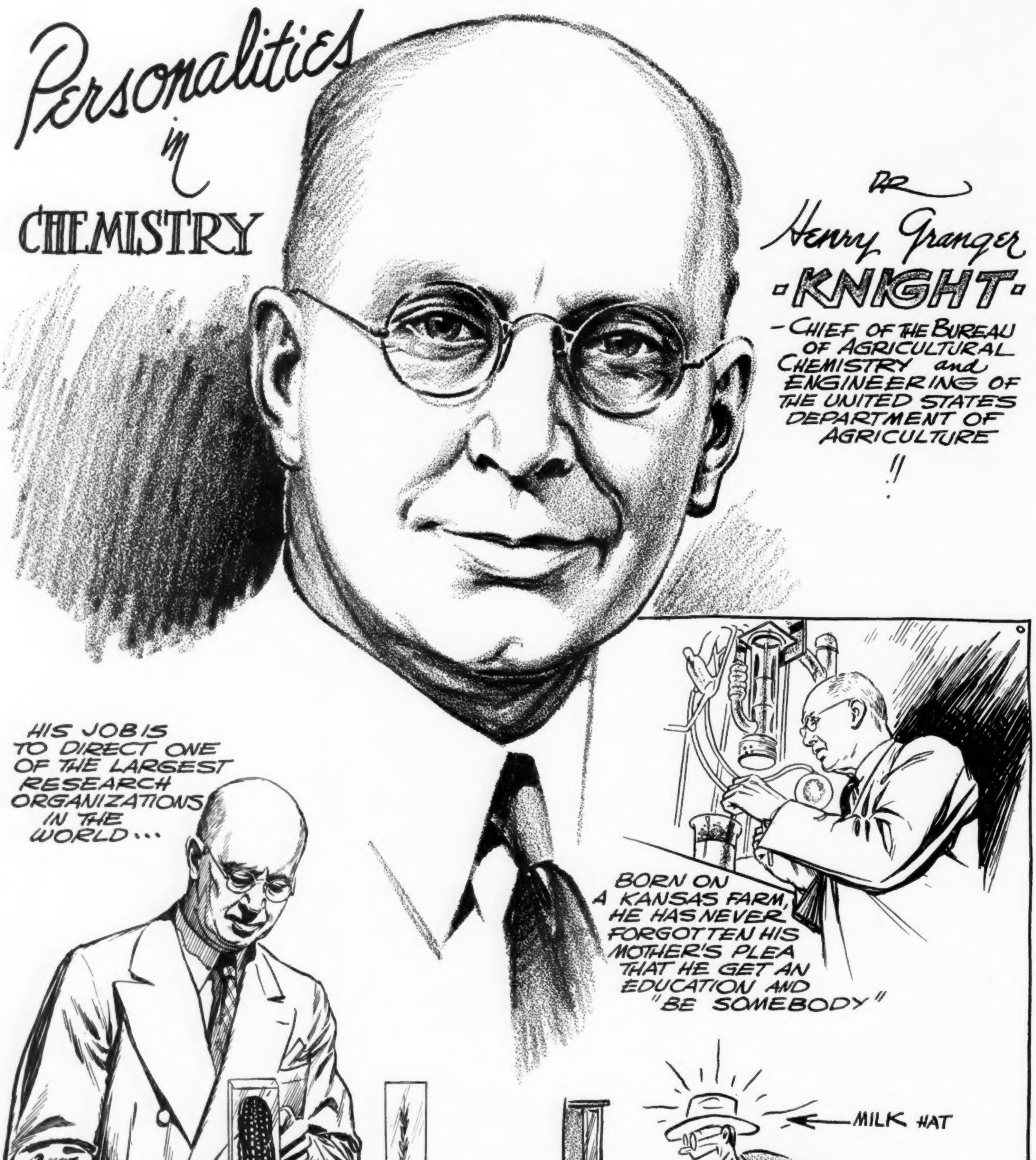

Personalities in CHEMISTRY
DR Henry Granger KNIGHT
- CHIEF OF THE BUREAU OF AGRICULTURAL CHEMISTRY and ENGINEERING OF THE UNITED STATES DEPARTMENT OF AGRICULTURE
!!
HIS JOB IS TO DIRECT ONE OF THE LARGEST RESEARCH ORGANIZATIONS IN THE WORLD...
BORN ON A KANSAS FARM, HE HAS NEVER FORGOTTEN HIS MOTHER'S PLEA THAT HE GET AN EDUCATION AND "BE SOMEBODY"
MILK HAT
FINDING NEW INDUSTRIAL OUTLETS FOR FARM PRODUCTS IS ONE OF THE OBJECTIVES OF HIS BUREAU.

HENRY GRANGER KNIGHT

By

A. D. McFadyen

VICE-PRESIDENT Henry A. Wallace, speaking in Washington on the evening of May 17 on behalf of the American Institute of Chemists, in bestowing the Institute's coveted medal upon Henry Granger Knight, Chief of the Bureau of Agricultural Chemistry and Engineering of the United States Department of Agriculture, pointed out that Knight's job is to direct one of the largest research organizations in the world. This Bureau has recently organized a special research program on new industrial uses for farm products. For years there has been talk about this idea of large-scale research to find new industrial outlets for the products of agriculture. At last the Congress has seen fit to give the idea a well organized and conclusive test.

In this attempt to find new and wider industrial uses for farm crops, particularly surplus crops, the set-up of the Bureau of Agricultural Chemistry and Engineering has been greatly expanded. In addition to its many field stations and the laboratories in Washington, four new regional farm products laboratories have been set up in Philadelphia, New Orleans, Peoria, Illinois, and Albany, California. Buildings for these laboratories have been completed and Dr. Knight and his assistants are now in the midst of the gigantic task of building up, gradually, of course, an additional research staff of approximately 1,000 scientists, mostly chemists and engineers, plus the necessary assistants, to man these laboratories. At present these regional laboratories are searching for new industrial outlets and markets on the following commodities: New Orleans—cotton, sweet potatoes, and peanuts; Philadelphia—tobacco, apples, Irish potatoes, milk products, vegetables, animal fats and oils, tanning materials, hides and skins; Peoria—corn, wheat, and agricultural waste products; Albany—fruits, vegetables, Irish potatoes, wheat, alfalfa, poultry products and by-products.

It is the policy of the Bureau when possible, to secure patents on all discoveries and processes developed, and such patents are dedicated to the public or to the Secretary of Agriculture to be operated under special license.

It has long been recognized by industry that research can be carried on as a self-sustaining, if not paying proposition. Knight believes the effort of his Bureau will yield even larger dividends than those realized by industry. In his office in Washington he kindles enthusiasm as he recites, between drafts on his cigarette, his dreams for agriculture—dreams that at last are to be transferred from the test tube to the pilot plant in order to prophesy the commercial profit. In this connection, Knight's program calls for much work on many of the fundamental substances, such as starches, oils and fats, proteins and so on. The blight that is wiping out present domestic sources of tank-bark, Knight indicates, presents the Bureau with the problem of producing tannin from agricultural products. The National Defense program and the matter of strategic materials alone will test the mettle of the Bureau. Some agricultural products, according to Knight, may have new outlets in the form of perfumes, medicines, plastics, building materials, and numerous other commodities. "Why, this new hat of mine," Knight continued, pointing to a stunning chapeau, "was made entirely from cow's milk. Our field is boundless!" Some of the research will be of a basic nature—the search for hidden facts, whether or not there be any immediate dollars-and-cents objective. But in the main, new industrial outlets for farm products will be the objective.

And judging from past performance of his Bureau, Knight's dreams will be realized. His Bureau helped to introduce the lowly but versatile soybean to industry. Much of the credit for the development of American dyes is due to the basic research of his Bureau, particularly in the economical production of intermediates. The research of the Bureau on the fixing of atmospheric nitrogen has been of inestimable value in the production of explosives for defense and in the production of cheap fertilizers for the farmer. The Bureau has been spectacularly successful in developing chemical methods for improving naval stores which mean turpentine and rosin. Its research has benefitted the beet sugar industry to the tune of $2,000,000 a year. The Bureau fostered canning of citrus juices and fruit and has added millions of dollars yearly to the earnings of citrus growers, not to mention more than fifty citrus by-products plants that havs gone into operation. The Bureau's frosted-food laboratories have supplied invaluable assistance to frozen food packers and have stimulated the establishment of this new food processing industry of much potential aid to farmers. Under the aegis of Knight's Bureau one cooperatively owned plant at Laurel, Miss., last year manufactured over 2,500,000 pounds of excellent white starch from sweet potatoes. Such are but a few of the accomplishments of his Bureau. It has been estimated that for every dollar spent by the Bureau of Agricultural Chemistry and Engineering in research, more than $200 has been returned to agriculture in savings and added income.

But Knight expects no sudden miracles from his work. "This is a long job we are tackling, and we don't expect overnight results."

In a way, Knight's present position is the flowering of a seed of ambition that was planted in

(Continued on Page 647)

PERMEABILITY
of Fiber Containers to Water Vapor

By Dr. Warren E. Emley
National Bureau of Standards

Dr. Warren E. Emley, Bureau of Standards, has clearly stated an important packaging problem. The answer to this is of utmost importance to the industry. It is hoped that public recognition of this problem will guarantee its ultimate solution in the not too distant future. It is encouraging to note that the American Society for Testing Materials has undertaken to set up a standard test. The Society may be assured that those who are charged with packaging chemicals will gladly cooperate in this study.

The following is a digest of Dr. Emley's paper given at the Packaging Conference of the American Management Association in Chicago on April second.

Richard W. Lahey
Packaging Editor

MANUFACTURERS of pulp and paper recognize the carton as an important and rapidly growing part of their industry. Manufacturers of almost everything else have noticed that the cost of containers is an important item in their balance sheets, but they realize that good containers are essential, in order that their products may be delivered to us, the ultimate consumers, in serviceable condition.

One of the important properties of a container is to protect the goods against damage in shipment and against any deterioration which may be caused by climatic conditions. The atmospheric agent which causes most worry is water. Of course if the contents are of such a nature that they would be seriously damaged by coming into contact with the water normally present in air, then some completely impervious type of container, such as glass or metal, must be used. But for the ordinary kinds of goods which naturally contain a certain amount of water, it is necessary only to prevent them from drying out or getting too moist.

Water is an essential constituent of many articles which are commonly sold in cartons. To illustrate the general presence of water in ordinary commodities, I need only enumerate the figures, cotton, 8%; paper, 10%; wool, 14%; leather, 15%, wood, 15%; as fair averages of the water contents of these materials. I should also emphasize the fact that if any of these materials were deprived of their water, their physical properties would change so that they would be entirely unsatisfactory for present uses. This phenomenon is familiar to all of you who use cigars or cigarettes.

The water which is present in such a material is not a constant quantity. It varies with the condition of the surrounding atmosphere, and to a slight extent, with the past history of the system. Water in a lake exerts a vapor pressure, which varies with the temperature and which creates a constant tendency for the water to evaporate and escape into the air. The water in this sheet of paper is likewise constantly trying to escape, the only difference being that at any given temperature, the vapor pressure of the water in the paper is quite different from that of the water in the lake. The paper has an affinity for water, which, in effect reduces the vapor pressure. When applying this reasoning, consideration must be given to the past history of the system, for previously wet paper has a greater affinity for water than previously dry paper has. That is, paper brought to moisture equilibrium with the atmosphere from the wet side will contain about 1% more water than the same paper brought to the same equilibrium from the dry side.

The factor which retards the escape of water from the lake or the sheet of paper is the vapor pressure of the water in the surrounding air. At any given temperature, a given volume of air will hold only so much water. If it contains less, there is a tendency for it to pick up more wherever a supply can be found; if it contains more, some will be deposited in the form of dew or frost. But the amount which it can contain varies with the temperature. Relative humidity is defined as the ratio between the amount of water which the air does contain and that which it could contain at the temperature specified, and is therefore a measure of the ability of the air to pick up water.

Applying this reasoning to the contents of a fiber board container, we find that there is always a vapor pressure tending to drive water out of the goods, and a back pressure of the water vapor in the air, tending to drive water into the goods. The direction of movement of the water will depend upon the relative magnitude of these two pressures. These are both varying continually: they depend upon the amounts of water already present in the goods and in the air, and also upon the temperature.

Circulation of the air must be brought into the picture at this point. When the air in immediate contact with the outside of the container has picked up its quota of water vapor so that equilibrium has been established between the two pressures, the air may stay in place and prevent any further action, or it may move away and be replaced by a fresh layer of air of different moisture content, and then the whole process of establishing equilibrium will have to be started all over again. Similarly, the layer of goods in contact with the inside of the container may delay the transmission of the water which it has picked up to the layer next to it, thus affording limited protection

to the contents as a whole. It is this latter action which makes it possible to ship quicklime in paper-lined barrels.

Paper liners for barrels, paper bags, and the fiber board of containers when unsized, are all readily penetrated by water vapor. Commercially, therefore, such paper products contain some material such as rosin size, wax, or asphalt, which will impede this penetration. It would be well if the penetration could be entirely stopped, but we know of no material which is 100% effective, so we must be content with impeding only with the maximum prevention that is possible. The following figures, taken from NBS Miscellaneous Publication M127 by F. T. Carson, give some idea of the relative resistance offered by materials commonly used as containers, expressed in g/24hrs/m^2/mm Hg: (Grams of water passing through 1 sq. meter of the material being tested in 24 hours, when the differential pressure is one millimeter of mercury).

Paper, 73 to 250
Waxed paper, .04 to 120
Regenerated cellulose, 38 to 360, same, waterproofed, .06 to 1.6
Vegetable parchment, 25 to 70
Glassine, 35 to 65,
same, waxed, .34 to 7.6
Cellulose acetate, .04 to 150
Cellulose nitrate, 1.4 to 15

Impedance involves time. The practical question may therefore be stated, "Can we impregnate or coat the container with some material which will prevent too great a transfer of water through the container during its life and under the conditions which it may be expected to encounter from the time when the container is filled until it is opened by the ultimate consumer?"

No General Answer

Such a question permits of no general answer; the answer must always be specific for each case. How large a transfer of water is "too great" will depend upon the nature of the goods. Can they gain or lose half their normal water content without creating consumer dissatisfaction? Are they to be shipped from a dry climate to a wet one, or vice versa, so that they may be expected to gain or lose weight in transit? If so, what effect will such gain or loss have on the quality, or, if the goods are sold by weight, on the price? Are the containers designed for a life or a few days, like the paper milk bottle, or must they continue to protect the goods during the devious course through jobber, wholesaler, and retailer, which may take as many years?

While the above picture may seem very complicated, it is by no means complete. For instance, the effect of the water on the container itself must be considered. If a paper product gets too dry, it will tend toward brittleness; if too wet, it will lose strength. In either event, it may no longer be able to protect the contents against rough handling.

If the container and its contents are cold, and are exposed to a warm moist atmosphere during shipment, liquid water will condense on the surface. While liquid water is not nearly so bad as water vapor in its ability to penetrate containers, the continued presence of the layer of liquid has about the same effect as though the container were surrounded by an atmosphere of 100% relative humidity.

If, in the effort to make the container resistant to the penetration of water vapor, the use of water-repellent, impregnating or coating materials is carried to the extreme, one may have difficulty in sealing the packages or printing on them. Special adhesives and inks have had to be developed for such cases.

The manufacturer of containers for bulk foods and similar products has an additional problem, in that the waterproofing agent must not impart any flavor or odor to the contents. Perhaps the new plastics might be found suitable for such containers, since their worth has already been proved in linings for tin cans.

There should be available a table showing the relative abilities of different kinds of containers to resist the passage of moisture and to withstand rough handling. Unfortunately, no such table exists. Not only do we have no such facts; we do not even know how to get them.

There are methods for measuring the bursting strength, tensile strength, tearing strength, water vapor permeability, and many other properties of paper and paper products. These will give definite, comparable information about the materials of which the container is made. But they give little information about the quality of the finished container. If the container board has a certain water vapor permeability what will be the permeability of the container as a whole, when the board has been bent at right angles, has been subjected to the racking and impact strains incident to shipping, and has been stored on some dealer's shelf for a year or

Top—Three prominent visitors to the 11th Annual Conference and Exposition on Packaging held at Chicago, Glenn C. Parsons, The Arner Co., Inc., Buffalo, N. Y.; W. O. Brewer, Calco Chemical Division of Cyanamid; and C. R. Miller, Eli Lilly & Co. Seated at the luncheon table, I. M. Sieff, Vice-Chairman, Marks & Spencer, Ltd., London, speaker at the luncheon meeting and Alvin E. Dodd, President of the American Packaging Association.

two? Especially, what will be the permeability at the seam where the container is sealed?

There is a method for measuring the compressive strength of containers. There is also the familiar drop test for measuring the bursting strength of a filled bag. There are steps, though very short ones, in the right direction. Some accelerated aging procedure is obviously needed, because we are interested in the properties of the container, not when it is first made nor even when it is first filled, but when it reaches the ultimate consumer, some years from now.

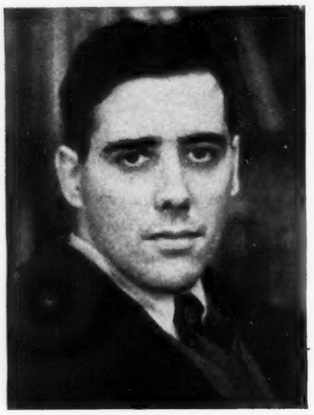
Survey First Step

The first step in the solution of the above problem is to make an intensive survey of the field, to develop, adapt, select, or in some way to get a set of testing methods. These should be designed to measure the relative abilities of different kinds of containers to protect the contents during shipment and storage. They should measure the properties of the containers themselves, and not of the materials used in making the containers. They should measure what the properties will be at some future date—not what they are now. This development of testing methods is in itself a research problem of considerable magnitude. I am happy to be able to announce that its solution has been undertaken by the American Society for Testing Materials.

When such methods become available, it will be a comparatively simple matter to test all kinds of containers to get the data necessary to construct the table mentioned above. Then the purchaser of containers need add only one more column to this table—price—and he will have before him the facts needed for the selection of the best container for his immediate purpose. The problem does not end with the selection of the best container; he must see to it that the container is properly filled and sealed.

If it runs true to form, such a table would also point out certain glaring defects in certain types of containers, which would immediately be remedied by the manufacturers.

Statistics published by the Manufacturing Chemists Association show that the cost of containers is almost as much as the cost of fuel and power, although this of course includes glass, metal and wood containers as well as paper products. Census reports show that the American public is spending upwards of one-half billion dollars annually for fiber containers and paper bags. Surely the lowly pasteboard carton has achieved a place in our industrial life, and a research program directed toward extending its uses is quite in order.



Foreign Literature DIGEST

By

T. E. R. Singer

PROM. ORG. KHIM (Ind. Org. Chem.) (USSR) VII, No. 12, p. 671-4 (1940).

Ethyl Amines from Acetaldehyde—The chemical-pharmaceutical industry alone in the Soviet requires tens of tons of diethyl amine annually. This compound could be used in even greater quantities in such industries as rubber and others, if diethyl amine were not so expensive. The pharmaceutical industry still produces it from diethyl aniline. The yield of such a process on a commercial scale is not more than 75% of the theoretical. The advantages of this process are its simplicity and the satisfactory quality of the product. Another well-known technical process for the production of diethyl amine, is from ethyl chloride and ammonia. The yield from this process is 47–68% of the theoretical. The process is carried out in an autoclave in a medium of absolute ethyl alcohol, and pure ethyl chloride is reacted with gaseous ammonia. This process is difficult in that ethyl chloride is a volatile compound that is easily lost, absolute ethyl alcohol is required, 40 atm. of pressure are required during operation, and the product is a mixture of amines which must be separated.

Catalytic Production

A great deal of work has been done on the catalytic production of diethyl amine from alcohol in the vapor phase. The best catalyst appeared to be a mixture of $Al_2O_3.SiO_2$ and the optimum temperature therefor 350°±10°. The yield was from 30–40%. Descriptions are given of the various methods for producing ethyl amines from alcohols and ammonia, also from aldehydes and ammonia.

The latter process is very attractive to the Soviet since acetaldehyde can be easily produced industrially, and is a by-product in some industries. In view of this, A. M. Grigorovski, A. I. Berkov, G. A. Gorlach, R. S. Margolin and S. B. Levitzkaya carried out experiments on the production of ethyl amines from acetaldehyde by the reduction alkylation of ammonia in the liquid phase on a commercial scale. The experimental work was carried out in steel autoclaves of 1 liter capacity and equipped with a mixer. The medium (ethyl alcohol or water) was saturated with gaseous ammonia to the proper concentration. A corresponding quantity of aldehyde was added to this mixture and the entire solution charged into the autoclave with an addition of 5–10% (of the weight of the aldehyde) of a nickel catalyst. The autoclave was filled with hydrogen to 12 atm. and heated within a given temperature range for about 1 1-2 to 2 hours (with mixing) until no more hydrogen was absorbed. The resulting mixture was neutralized with sulfuric acid, the insoluble ammonium sulfate filtered out, the alcohol distilled off and the amines separated out by a solution of caustic soda, and fraction distilled.

Variations of Process

Variations were introduced into the process and are discussed. 44–51% of the theoretical yield of diethyl amine was obtained, or 1 kg. of diethyl amine per 2.5–2.8 kg. of acetaldehyde. These results make the process worth considering for industrial production. The authors found that many difficulties were overcome by the observation that excess ammonia or amine resulted in better reduction alkylation of the acetaldehyde. Experiments were tried in which aldehyde was added in continually smaller quantities to the reaction mixture so that the ammonia might be converted completely to the primary amine. Then the process was continued without interruption with gradual additions of acetaldehyde, until diethyl amine was formed. Better than 80% of the theoretical yield of fairly pure monoethyl amine was obtained by the reduction alkylation of excess ammonia by means of acetaldehyde in the liquid phase with a nickel catalyst. A 60% yield of satisfactory diethyl amine could be obtained similarly by the reduction alkylation of monoethyl amine. When the acetaldehyde is conducted into the reaction mass gradually, diethyl amine can be obtained in one continuous process with a direct yield of diethyl amine of 50% of the theoretical. This new method will probably be applied industrially since the conditions of the process are easily met and acetaldehyde is an inexpensive raw material.

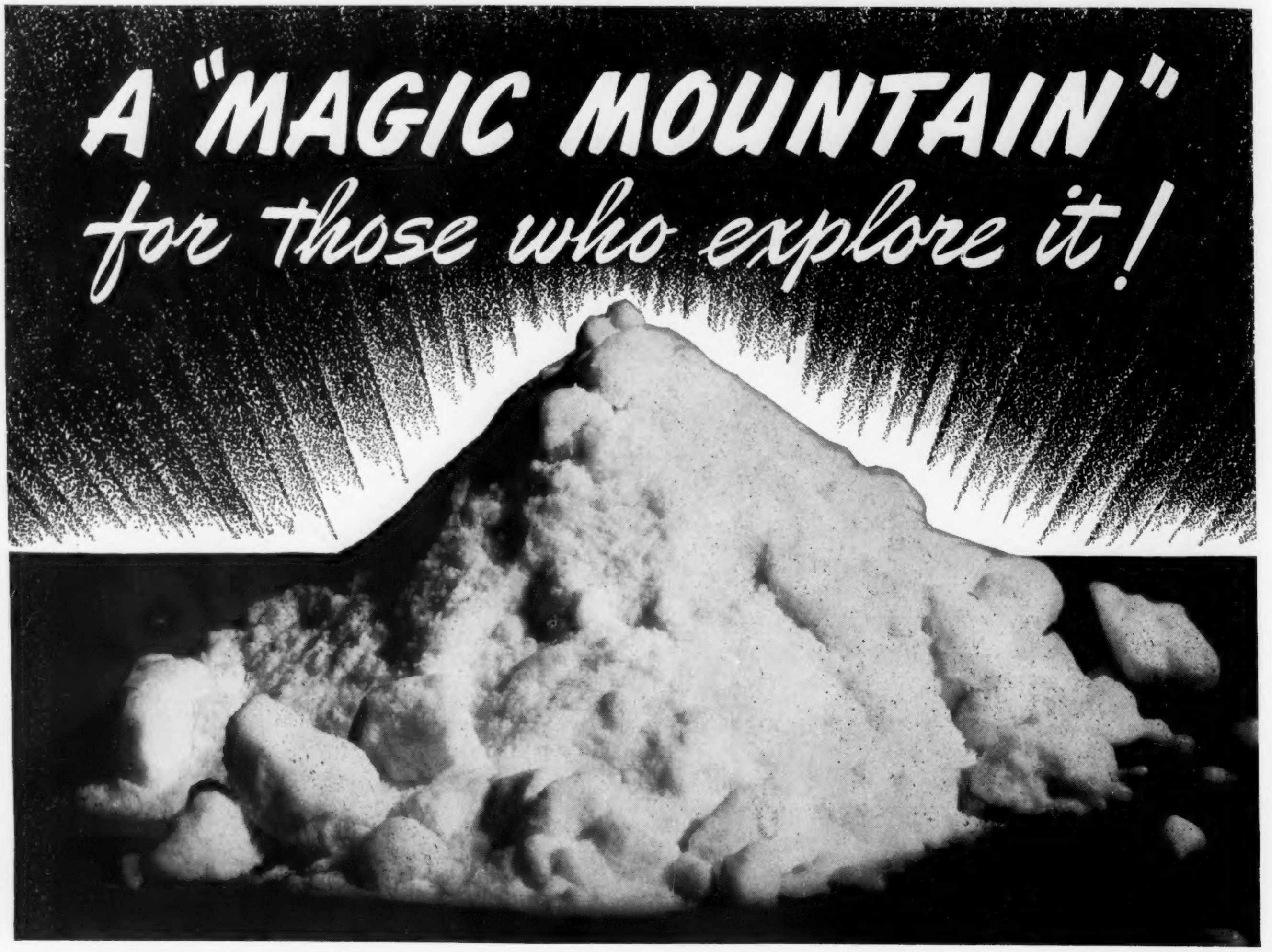
C. C. Franck, Westinghouse; C. W. Kellogg, OPM; and John I. Yellott, Illinois Institute of Technology (left to right), during the Midwest Power Conference ASME luncheon sponsored by the Illinois Institute of Technology in Chicago last month.

Upper right, Irving H. Taylor, recently elected vice-president in charge of sales of the Michigan Alkali Co. Right, George F. Smith who resigned April 1 as vice-president and general manager of Philipp Brothers to enter his own business as manufacturer's agent in the Lincoln Building, New York City.

"Headliners" In the News

Left, Harlow Bradley, who has just been appointed supervisor of foreign dealers for Allis Chalmers. Below, W. J. Rheinhans, Allis Chalmers, and R. B. McWhorter, Federal Power Commission, shake hands at the Midwest Power Conference in Chicago sponsored by the Illinois Institute of Technology.

Upper right, Dr. D. Olan Meeker, B.S., Chem. Eng., M.D., who recently joined the staff of Murray Breese Associates, advertising and marketing, as director of medical research. Lower right, C. L. Schroeder, vice-president of McLaughlin Gormley King, Minneapolis, who has been appointed general sales manager of the company. Below, H. Boezinger, newly-elected vice-president of the Merco Nordstrom Valve Co.



Let These Chemical Guide Posts Show You The Way to Important Savings with TSPP

THERE'S REAL MAGIC in this "mountain" of Tetra Sodium Pyrophosphate. And it's there because TSPP is a chemical of almost incredible versatility. Once a laboratory curiosity, its properties and uses are now being "explored" by industry with money-saving results.

So that those still unacquainted with TSPP may profit from its unusual properties and from applications already discovered, we offer the following guide posts to its use:

APPLICATIONS: The jobs that TSPP can help to do better, or for less cost, (or both) are found in countless industries. To name just a few: in soap manufacture; in commercial laundries; in wet finishing of cotton, rayon, silk and wool; in making mixed detergents; in machine dishwashing, cleaning of rugs, metals, and dairy equipment; and in the vitreous enamel industry for enamel slips and cover coats.

PROPERTIES: The ability of TSPP to serve in these varied applications lies in its unusual combination of properties. For example: TSPP will reduce the quantity of insoluble hardwater soaps formed by magnesium and calcium hardness—will keep iron compounds in water in a soluble or dispersed form — will act as an efficient suspending and dispersing agent for most inert and insoluble materials—and will give some "wetting" action, lowering surface tension of solutions and aiding in emulsification of oils and greases.

Other Facts About Du Pont TSPP

- Formula—$Na_4P_2O_7$
- Comes in either powdered or granular form.
- Free flowing.
- Mildly alkaline—pH 9.1—10.3.
- Readily soluble in hot or cold water and in distilled water as follows:

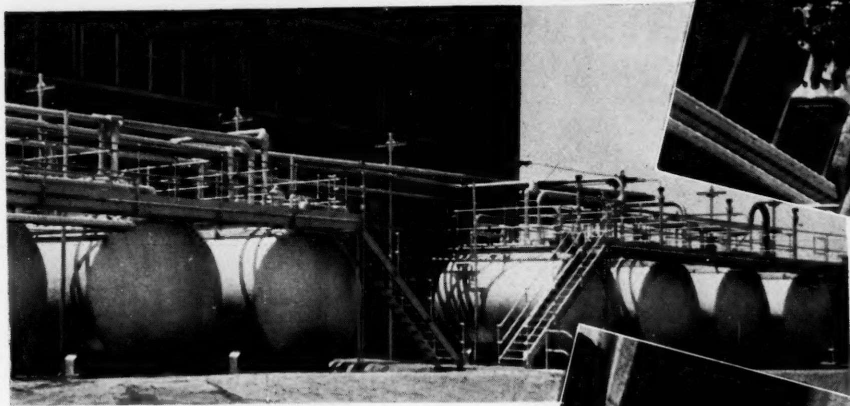
Water Temperature Fahrenheit	*Parts TSPP in 100 parts H_2O*	*Ounces TSPP per gal. H_2O*
68°	6.2	7.7
140°	21.8	24.0
212°	40.0	38.2

TECHNICAL SERVICE: In such brief space, only a glimpse of TSPP "magic" can be given. Nevertheless, if it has suggested the possibility of doing some job better, or more economically in your plant, we invite you to share in our knowledge of this versatile chemical. For information, or technical assistance, write or call: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington, Del.

DU PONT REG. U. S. PAT. OFF. **TETRA SODIUM PYROPHOSPHATE**

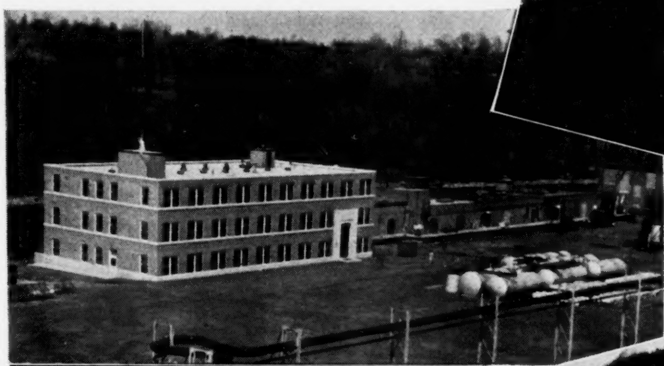
New Resinox Plant

Monsanto Chemical Company's Plastics Division held open house at Springfield, Mass., April 29, for the official opening of a plant for the production of phenol-formaldehyde molding materials. Special cars brought editors, public officials and officers of the Company from New York and other points. CHEMICAL INDUSTRIES here presents a pictorial report.



Above and upper right, two exterior views of new Resinox unit. Below, Plastics Research Laboratory looking from roof of new Resinox building.

Below, Roger L. Putnam, Mayor of Springfield and John C. Brooks, vice-president and general manager of Plastics Division. Left, Charles Lichtenberg, manager of molding materials sales.



Above, John H. Clark, general manager of sales and J. W. Irwin, assistant to the president. Below, group of visitors watching molten resin being poured from kettle on to cold steel floor to harden.

Above, left to right, J. R. Turnbull advertising and sales promotion manager; Carl T. King, manager of production; Fred S. Gronemeyer, plant manager.

Below, left to right, M. A. Brown, F. A. Abbiati, assistant general manager of sales; Thomas Martin, research chemist and C. L. Jones, technical sales department.

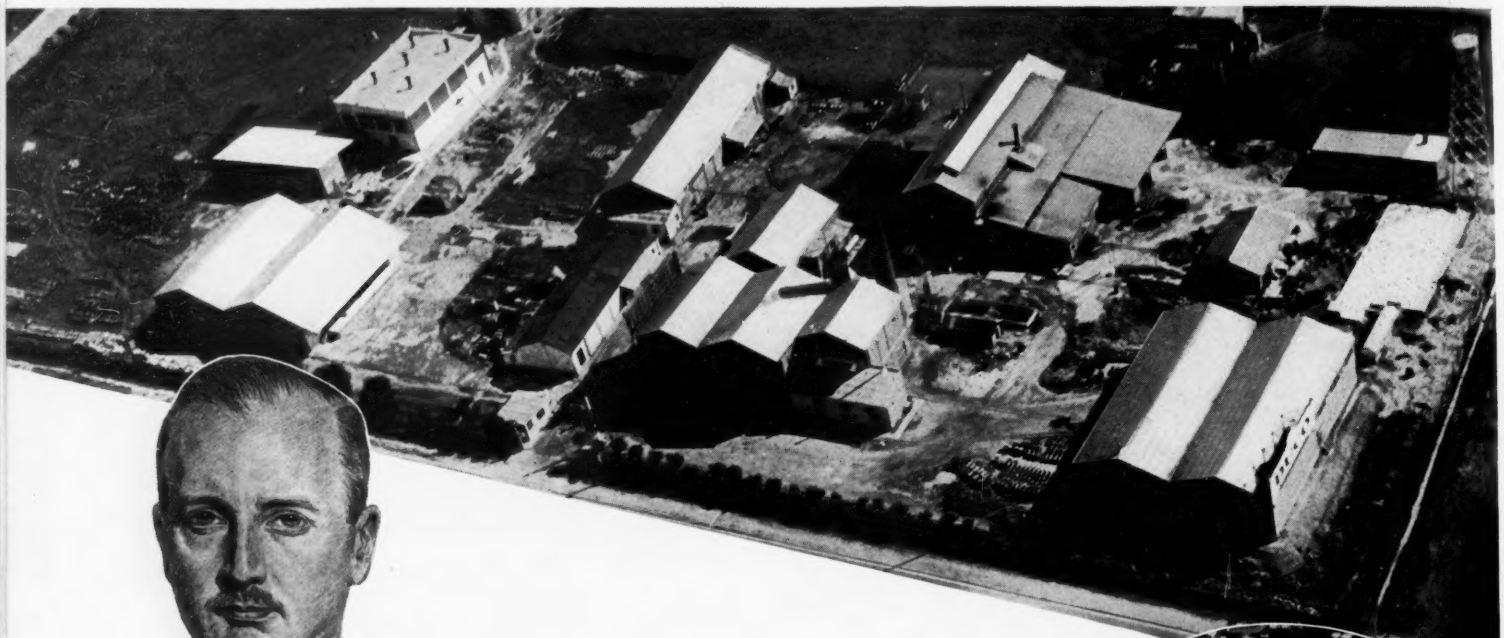
"DUPERIAL"

Industrias Quimicas Argentinas

The industrialization of South America is progressing at a much faster rate than most of us suspect. One of the most important factors in the chemical field is known in the Argentine as Industrias Quimicas Argentinas, jointly owned by DuPont and Imperial Chemical Industries.

At the left, the Orbea Plant, one of seven main plants of the company in the Argentine. Located at Quilmes, F. C. S., this factory produces sporting cartridges.

Below, the Gerli plant where manufacture of "Duco" and "Dulux" finishes is concentrated; also the production of carbon bisulfide. The high temperatures and extreme humidity of the climate create some special paint problems. High grade solvents are required in lacquer formulation.



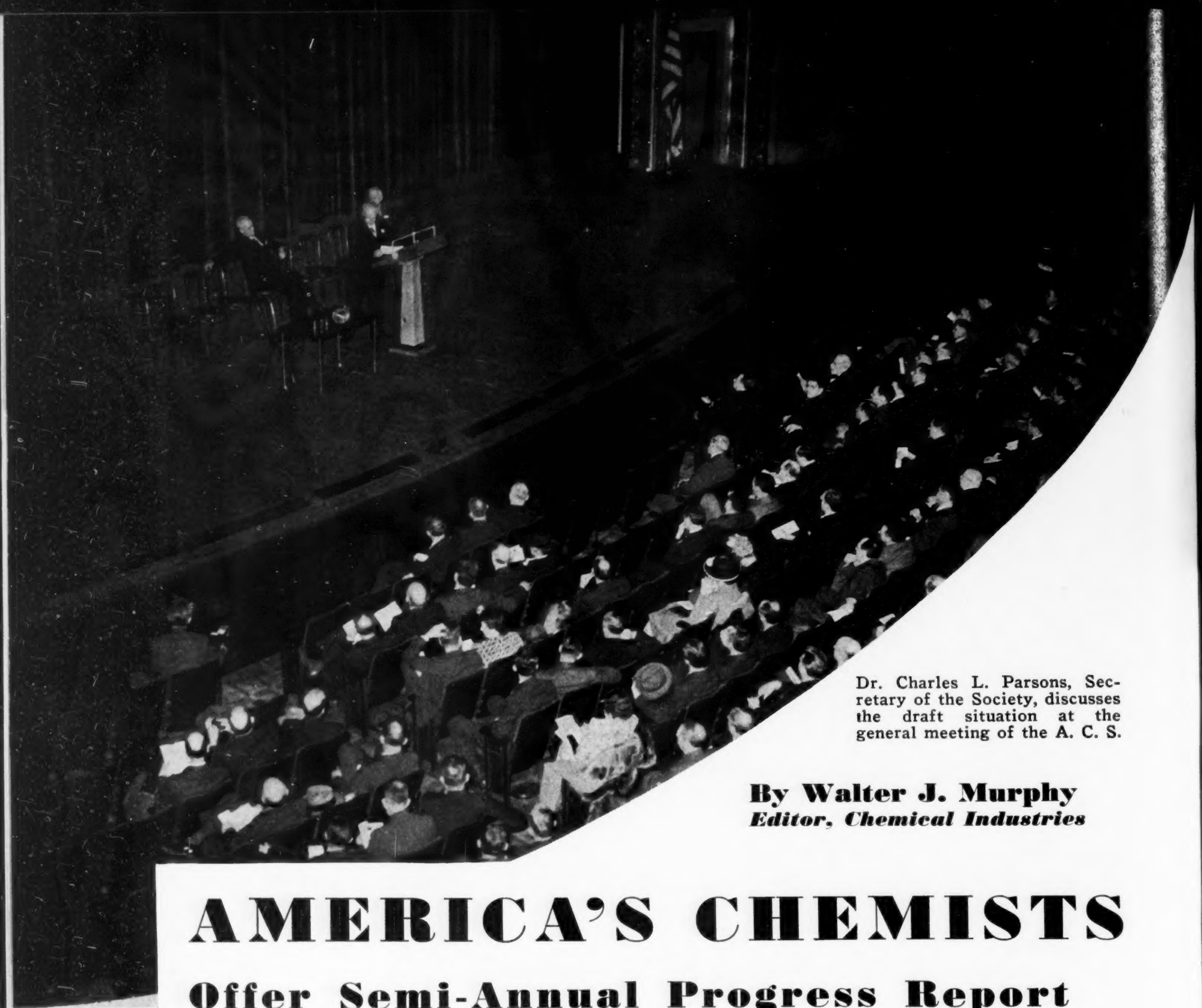
At the left, General Manager Robert Salmon who heads up the offices located on Paseo Colon, one of the magnificent new boulevards of Buenos Aires. Right, the important Ducilo Plant, located at Berazategui, where rayon yarn is produced.

Below, left, the "La Sulfurica" Plant, located at Sarandi, where heavy chemicals are produced. Right, the Industria Plant at Avellaneda, where refined and ground sulfurs are manufactured and where imported chemicals are stored. A sixth plant at Mendoza in the wine growing regions produces tartaric acid, and a seventh plant at Electroclor at the big up-river industrial center and port of Rosario produces caustic, chlorine and ammonia.

Carbide & Carbon's Vinylite plastics were given a new use recently when Sheldon Keck of the Brooklyn Museum restored this Italo-Byzantine icon. Surface film was removed first revealing a colorful paint film which was immediately given a protective coating of Vinylite series A resin applied in ethyl alcohol. Next the painting was transferred and given a clear Vinylite plastic support. Photo shows original and cleaned states.

NEW CHEMICALS FOR INDUSTRY

Digest of Chemical Developments in Converting and Processing Fields



Dr. Charles L. Parsons, Secretary of the Society, discusses the draft situation at the general meeting of the A. C. S.

By Walter J. Murphy
Editor, Chemical Industries

AMERICA'S CHEMISTS

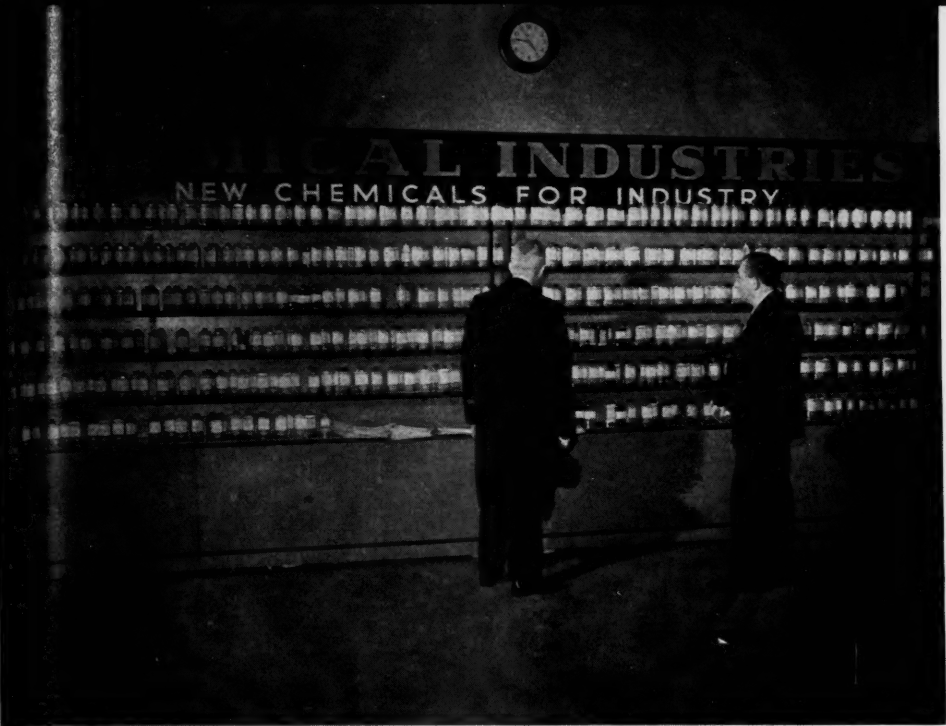
Offer Semi-Annual Progress Report

Considerable criticism has been leveled at the rate of transforming industrial America from a peace to a war footing. The chemical industry — a key industry — can be proud of its accomplishments. Walter J. Murphy, Editor of Chemical Industries, reports what America's chemists and chemical engineers are doing to further the defense plans of the nation as told to members of the American Chemical Society in St. Louis last month. Will there be a sufficient number of trained men? What about drafting chemists? What new products and processes are coming out of the laboratories of the country working at a feverish pitch?

THE 101st Meeting of the American Chemical Society, held in St. Louis during the week of April 7-11, was featured by discussions of pressing national defense problems related to food and nutrition, health and medicinal chemistry, development of synthetics, and the maintenance of an adequate supply of trained chemists and chemical engineers during the present emergency. The meeting failed to bring forth the normal number of papers dealing with new discoveries and improvements in existing processes and methods and this was particularly true in the general field of industrial chemistry. This trend, first noticed at the Cincinnati meeting one year ago, is likely to become even more pronounced for voluntary censorship will likely prevent important disclosures from being made at the Society meetings as long as the country is directing its energies to defense. This is an intelligent point of view and one with which no real thinking person can quarrel. The scientific press is lending every aid to the program of withholding information that might be of value to possible enemies.

The immense and important influence of the American Chemical Society was placed behind the movement to hold chemists and chemical engineers in industry when at the general meeting Dr. Charles L. Parsons, Secretary of the Society, stated in a specially prepared paper that "National defense demands the conservation of the nation's chemists and chemical engineers." On the platform with Dr. Parsons was Major Joseph S. Battley, U. S. A., Chief, Occupational Deferment of the Selective Service System.

The threatened depletion of the supply of technical brains needed by the chemical industry has created a grave situation, according to Dr. Parsons, who, warning against "misguided patriotism," asserted that "to draft chemists into the military service, where their precious talents will not be utilized, is to waste an important resource in national defense."



Chemical Industries' display—"New Chemicals for Industry"—attracted the attention of many of the visiting executives, chemists and engineers.

"This is a new kind of war, where the armed forces may be secondary even to the devices with which they fight. Indeed, the ratio of the World War of eighty-seven workers for every thirteen men in the armed forces may be greatly increased.

"If, then, this is a war where matériel is certainly equal, if not a little bit more important than vast man power in the field, then obviously to produce matériel in the quantities needed requires not only billions of man-hours, but men of the highest skill and the finest training."

Some methods must be found to prevent further inroads into the ranks of chemists and chemical engineers, all of whom are "in the Production Army now," Dr. Parsons pointed out.

"The situation is grave," Dr. Parsons said. "The supply of chemists and chemical engineers does not now meet the demand. The demand is increasing, but the prospective output is falling more and more rapidly below normal. While the draft boards, with the aid of the state advisers on occupational deferments, have deferred most chemists and chemical engineers engaged in the production program, there are a number of men with years of special training, even through the doctorate degree, who are serving as privates in the Army, where their specific ability is lost to the country.

"The number is not large. It was inevitable that in such an immense undertaking some mistakes would be made by the local boards and even by a few state deferment officials. This same thing would not be permitted for a moment in Germany, England or Canada; nor was it permitted in the United States in the last World War.

"In the last war, by order of Secretary Baker, chemists in the service were either returned to industry or put in specific chemical production in the Army. Conditions in this emergency are entirely different. General Hershey has pointed out that the specific need is for 'matériel' not 'men,' and has emphasized strongly that men essential to the production of materials and in training therefor should be deferred.

"The Army and Navy have almost no use for chemists per se, except in the arsenals. The positions in the arsenals and in the Departmental Service have already been filled through Civil Service procedure by civilians, most of whom have been functioning for years. By law, vacancies can be filled only through the Civil Service.

"If I am correctly informed, the Army itself is at a loss to know what to do with chemical draftees who, they fully realize, are wasting their rare talents in the ranks. A few have been assigned to the Medical Corps, usually to perform simple tasks for which doctors normally use thousands of technicians and nurses they themselves have trained. This results in as much of a loss to the procurement program as if they were kept in the combat forces.

"On the other hand, industry is suffering and is going to suffer more. This is especially true since most chemists and chemical engineers in the colleges eligible for the draft anticipate induction into the service as privates on July 1. Many of those who are training these students are subject to the same conditions.

"I do not anticipate that this is going to occur because I feel certain that the War Department realizes the emergency and that, by some procedure, it will be met. Nevertheless, there is a grave problem, and the outlook is serious."

A vast change has taken place in the chemical industry since the First World War, Dr. Parsons explained. "The chemical industry had but blossomed in this country, and the Government itself was forced to become the producer of matériel. At the end of the First World War, there were more than 4,000 chemists in uniform functioning as chemists, a large portion being commissioned officers exactly as in the Medical Corps.

"Today, with one or two minor exceptions, all matériel is being produced, or is to be produced, in plants financed or subsidized by the Government, to the extent of many millions of dollars, but operated by private corporations. We have the largest, most complete, most highly developed and most efficient chemical industry in the world, fully equipped for action and turning out literally dozens of new products daily. Many of these are essen-

Below, left to right, C. R. Johnson, Continental Carbon; Harry Outcault, St. Joseph's Lead; George Horejsi, Intercoastal Paint; H. L. Young, American Zinc Sales. Below, R. E. Prince, James B. Day & Co., and President of the Paint Production Group; and a delegation from Sharples Chemicals Inc.—B. M. Barl, M. J. Hiler, C. E. Gill and H. H. Nelson.

tial to the national defense, and all influence the national welfare and interest.

"On the other hand, the armed forces today need no chemists in uniform to function as such, for the various arsenals prepared themselves in advance with experienced employees in civilian capacity through the Civil Service Commission. The Government itself has no need for enlisted chemists. Even Chemical Warfare Reserve Officers trained for anticipated need, but as yet supernumeraries, are largely being held in a Reserve Pool in order that they may continue their present usefulness in industry.

"Where we formerly received hundreds of requests for personnel, not a single request has come from the Army or Navy for a chemically trained officer or private. The few that have been mistakenly inducted by the local boards are deprived of their specific usefulness gained by years of training and study. Yet, all chemists and all chemical engineers are in the Production Army now.'

'The explanation is simple. In the World War we were in active warfare, and well equipped combat forces were the price of victory. The equipment, especially chemical equipment, was a Government activity. In this emergency, we are ordered by our Commander-in-Chief to become 'the Arsenal of Democracy.' We have been fully charged by authority that 'matériel' rather than 'men' is the world's salvation. General Hershey has done his utmost to impress this concept on the deferment board who are the final authority in classifying the draftees.

"Chemists and chemical engineers are the trained 'officers and men' of the production program, just as essential to its operation and output as are trained 'officers and men' to the accurate firing of the heavy artillery on our battleships and in our coast defenses. Without chemists and chemical engineers our industry cannot function. The supply is not adequate. Draftees' positions can be filled only by creating other vacancies through competitive bidding.

"So far as I have been able to determine, no country but our own will permit trained chemists and chemical engineers to volunteer for, or serve in, the combat forces. They are essential elsewhere. If destroyed, their places cannot be filled, for it takes four years to educate and train even the 'privates' in the chemical profession, and at least seven years for those of 'officer' grade. No profession requires more years of intensive study and experience.

"In spite of these facts, chemists and chemical engineers are not as a class deferred in the draft as set up in this emergency. Nor should they be. Group deferment, as such, would lead to many abuses. Not all individuals claiming to be chemists have a right to the title. It is training, experience and brains that make a man 'essential,' not the cognomen.

"Nevertheless, the fact remains that properly trained chemists and chemical engineers are essential men, that the country is in dire need of their services where they can serve best, and that the 'arsenal' we are preparing to save Democracy will not be filled without their individual aid. I have yet to find one of them unwilling to serve full-time and over-time in the Army and without thought of personal compensation, if he can only feel assured that his qualifications are being utilized with intelligence."

The American Chemical Society has made a survey of the supply and demand for chemists and chemical engineers in 1941, Dr. Parsons reported. "The indicated demand is at least 2,000 more than the supply," according to Dr. Parsons.

"This is conservative. Twenty-five industries alone reported a requirement of 1,401. Five hundred and six colleges reported 6,104 candidates for baccalaureate and advanced degrees in chemistry and 1,915 in chemical engineering. This is the 1941 crop.

"There are almost no employable chemists now unemployed. This, together with the 1941 deficiency, makes every chemist engaged in 'civilian activities which are contributing to the national health, safety, and interest' a key man in the national defense, since he can be replaced only by competitive bidding for another man already so engaged. Such bidding has begun. Already, hundreds of the graduating class of 1941 have been placed. Some departments have placed their entire output."

Major Battley in discussing his subject of "The Relation of the Chemical Profession to Selective Service" stated that Dr. Parsons has stolen "most of his thunder." The Major, who is well acquainted with the problems of the chemical industry through his work as NRA Administrator for the chemical industry during the "Blue Eagle" days, answered a large number of questions from the audience and urged industry and the heads of our technical schools to assist employees and good students in making requests for draft deferment.

OPM-Chemical Division

The chemical division of the Office of Production Management intends to provide sufficient raw materials to operate every munitions plant at full capacity twenty-four hours a day and 365 days a year, Dr. Edward R. Weidlein, director of the Mellon Institute of Industrial Research, Pittsburgh, declared in an address on "Chemistry in National Defense" at the opening session.

The OPM chemical group is considerably ahead of schedule, Dr. Weidlein reported, urging chemists not to overlook for a moment "the gigantic, the almost alarming, dimensions of the job that is cut out for us."

Nitrogen is the most serious problem faced by the chemical group, according to Dr. Weidlein. While the petroleum industry will be able to supply every foreseeable demand for petroleum and its products without requiring any Government funds or advance Government contracts, he warned that, in the event of a naval war in the Atlantic which might result in the loss of some tankers and necessitate the use of a convoy system, there would undoubtedly be serious difficulty in supplying civilian requirements on the East coast.

"Throughout 1941 we will be able to meet all the nitrogen demands of the defense program together with the needs of the industries and agriculture," Dr. Weidlein explained. "The Government through the industries has constructed three new synthetic nitrogen plants and, as a form of additional insurance, imports of sodium nitrate have been increased substantially from Chile.

"The nitrogen balance of the country depends on the supply side mainly from the production of synthetic nitrogen and of by-product ammonia and on imports of sodium nitrate from Chile. There is a small amount of cyanamide imported from Canada, but we cannot rely upon this source. We are at present accumulating stock balances of ammonia and this effort is being aided by the Export Control Administration.

"In order to prevent shortages in the

A tour through cellars of the American Wine Co. where champagne is stored.

supply of certain types of nitrogen compounds, it may be necessary to direct some forms of nitrogen into other channels. For example, it may be needful to substitute Chilean nitrate temporarily as a raw material in certain present applications for synthetic ammonia or its derivatives. In this way it would be possible to release synthetic ammonia for uses for which it is especially adapted.

"Our present concern is the fact that it requires from eighteen months to two years to build a synthetic ammonia plant, while munitions plants can be constructed in a period of eight or nine months. Accordingly, if conditions become serious, it may be necessary to curtail the use of nitrogen for industrial and certain agricultural uses in order to meet the demands. This policy, which would assuredly give a sufficient quantity of nitrogen for a heavy munitions program, naturally would be adopted only as a last resort."

The nation is assured of an ample supply of toluene, basis of TNT, Dr. Weidlein reported. Several petroleum companies are proposing plants in units of 5,000,000 gallons, and it is estimated that toluene production could be increased from this source by 100,000,000 gallons annually. The Government is building a plant in Texas to make toluene from petroleum in a quantity equal to the total production now obtained from by-product coking. This plant will be Government-owned, Government-controlled, but operated by industry. The cotton linters problem has been attended to in a similar manner.

The actual estimation of defense requirements for petroleum and its various products, Dr. Weidlein pointed out, is not a simple task and does not lead to any single figure for such requirements, because the demand for petroleum products will increase steadily as our preparedness program provides our Army and Navy with increasing quantities of mechanical equipment.

"The only possible bottleneck which gives us concern is in tanker transportation to the East coast. About 95 per cent of the petroleum products consumed by East coast states are delivered there by tanker, either in the form of crude or refined products, and mainly from the Gulf coast. The movement from the Gulf coast alone amounts to about 1,350,000 barrels per day and requires the services of a fleet of 260 domestic tankers."

Dr. Weidlein described the sulfuric acid situation as a promising picture, as it is necessary only to increase the nation's oleum capacity to meet the demands. Production facilities for activated carbon of the type suited for gas masks are entirely inadequate to satisfy the Chemical Warfare Service, he said. Therefore these facilities are being increased by the construction of new plants.

Discussing antimony sulfide, an essential ingredient of primers, Dr. Weidlein said that experiments in the past war and during 1940 have shown that it is difficult to make from Bolivian or Mexican ores a synthetic product equal to the Chinese antimony sulfide. "Primers from these ores do not have the same sensitivity; the synthetic material has in fact proved to be unsatisfactory. The opening up of the Burma Road has temporarily relieved anxiety regarding supplies from China, but this problem has been presented to the National Research Committee for further investigation."

Dr. Weidlein said that large stores of important drug materials have been accumulated, and that two to three years' supplies of such important drugs as iodine, opium, and quinine are at hand. "Ordinarily we would feel very comfortable regarding this situation, but it must be borne in mind that our arsenal for medical munitions on the public health and medical front is for all the Americas. Hemisphere defense means hemisphere strength and therefore the policy of our Government is to see that we have sufficient quantities of medical supplies to meet all the demands made upon us by the other Americas."

Many of the nation's difficulties in obtaining strategic materials, Dr. Weidlein stated, can be traced to the draining out of the country over the past few years of products needed for defense purposes.

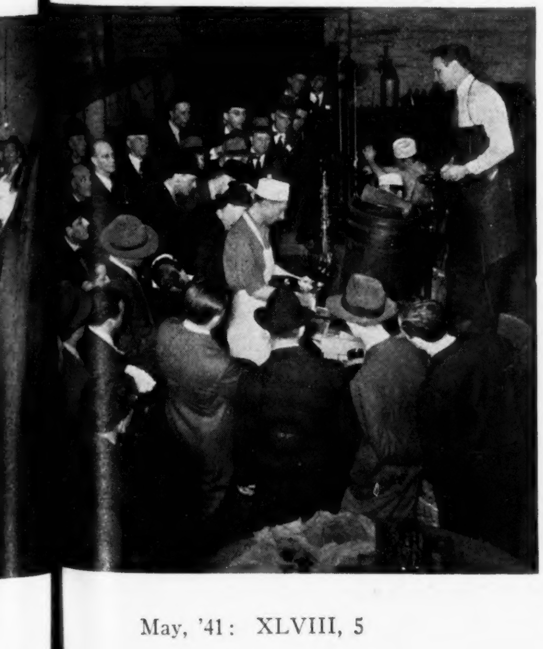
"The demand for these essentials came from neutrals as well as belligerents. The only control over this commerce prior to last July was the limitation of international traffic in arms, whose major effect was the restriction and curtailment of our domestic production of the weapons of defense, leaving us a scarcity of munitions and practically eliminating the facilities for their production, the facilities being feverishly built during the present crisis."

This country has been industrially unprepared for protection from attack, Dr. Weidlein added, "The chemical industries have been as far away from the munitions business as it was possible for them to get. Plants used in the First World War were dismantled. For future welfare, therefore, martial machinery must be built from the ground up. Industrial and scientific organizations must be brought together to do well a highly technical job. Men must be trained. It is my opinion that every professional chemist, chemical engineer, and technician will be needed effectively to carry out the various essential projects required.

"The present program is far ahead of the progress that was made in the first six months of the First World War in spite of the many obstacles that we have had to overcome. I anticipate that results will become more apparent within the next three or four months, when the ground work will have been completely laid and production will begin to approach maximum capacity.

"The success of this program depends upon the complete cooperation of industry to maintain their introductory stocks of raw materials. If industry starts to accumulate stocks in excess of their normal stockpile, it will defeat the entire defense program and will bring about severe priority regulations in the industry."

One did not need to thirst at the informative Anheuser-Busch Brewery trip.



Petroleum as a Raw Material

The American chemical industry has seized the initiative from all competitors and potentially can outstrip them all, Dr. Hugh S. Taylor, head of the department of chemistry at Princeton University, declared in an address on "Catalysis Serves the Petroleum Industry" at the opening general session.

"Not only will the petroleum industry take care of its conceivable normal needs, which will include the high grade fuel that is necessary for modern aviation, especially in time of war, but also it will serve both explosive and rubber industries providing them with raw materials essential for their development in the period of stress.

"Synthetic rubber, toluene, and glycerine for explosives have in the past year come forward as important units in the national defense program and petroleum refineries have already begun to supply the raw materials necessary.

"It is the new processes of dehydroaromatization which make the petroleum in-

dustry an active competitor of the by-product coke-oven industry in the production of raw materials for the dyestuff industry, explosives and many pharmaceutical preparations, rendering these latter independent of the hitherto necessary tie between coke requirements and by-products.

"Catalytic hydrogenation which has been employed to convert heavy hydrocarbons into lighter gasolines has now been succeeded by catalytic processes of dehydrogenation and these have been coupled with catalytic processes of cyclization or ring formation in which aromatic fuels containing benzene, toluene, and xylene form the important products.

"Paralleling in intensity these developments with the more complex units of petroleum raw materials, a series of efforts have evaluated the lighter constituents of petroleum, natural gas, and the cracked gases of refinery operation. The industry is now engaged in an intensive effort to utilize for chemical purposes the major gaseous hydrocarbons available.

"The resources of the nation in methane are so large that an enormous chemical industry can be based on its proper utilization. Hitherto, apart from its use as a gaseous fuel, conveyed in pipe lines to centers of consumption, or as the raw material for the carbon black industry, this major constituent of the natural gas of the country has been largely unused.

"Catalytic processes are now available for converting methane and air into the nitrogen-hydrogen mixture used for synthetic ammonia production. With skilled chemical engineering, this conversion can be achieved at costs which make it an active competitor of similar gas mixtures from coke. Ammonia production can, therefore, be largely decentralized, moved away from the coke-producing regions. All the industries which stem from a cheap hydrogen source are similarly possible.

"It is apparent that the methyl alcohol-higher alcohol industry can be developed with the hydrogen-carbon monoxide mixtures obtainable from methane sources and at attractive competitive price levels. Cheap sources of water gas from the methane raw material suggest also a re-examination of the economics of the Fischer-Tropsch method of producing higher hydrocarbons by catalytic action at pressures in the range of 1 to 10 atmospheres with catalytic agents of the cobalt-thoria type.

"This process went into commercial production in Germany in 1936, with water gas from lignite sources. It has been estimated that over 1,000,000 tons of hydrocarbons are now being produced annually in Germany by this process. It lends itself especially to decentralization of production. Small units may be located at suitable points for the service of a given area with liquid fuel, in marked contrast to the process of high-pressure hydrogenation of coal developed by Bergius, which demands, for economical operation, a large single unit.

"The immediate product of the Fischer-Tropsch process consists largely of normal saturated and olefinic paraffins unsuitable for use as high grade fuels. The techniques necessary for the conversion of such materials to obtain useful fuels are, however, solved by the catalytic processes of cracking and dehydrogenation now developed."

Dr. Taylor explained that catalytic processes have been developed for the direct oxidation of ethylene at metal surfaces, notably silver surfaces, to yield ethylene oxide, a reagent of great value in a series of synthetic processes and the intermediate in the production of ethylene glycol, a product now required on a tonnage basis for anti-freeze solutions.

"Propylene, the next higher unsaturated olefinic hydrocarbon, is by reason of a newly developed process the raw material for synthetic production of glycerine available at any moment when the by-product glycerine of soap manufacture becomes inadequate to meet the demands.

"Butylene yields the butadiene which is the starting material for the synthetic rubbers of the buna-types developed in Germany. Further, the developments in producing synthetic rubbers from butylene promise to furnish another outlet in synthetic chemistry for a petroleum refinery product. The progress which has been achieved in the synthetic rubber field represents a major advance when compared with the early German effort in 1914-1918."

Removal of Fluorides

Progress in the removal of fluorides from water supplies was reported by Dr. R. C. Goodwin and James Litton, both of Texas Technological College, through the use of activated calcium phosphate.

The method employed consisted in passing the raw water through a pilot plant charged with the calcium phosphate until the fluoride content of the effluent water reached a value of 1 part per million. The phosphate was then regenerated with one per cent sodium hydroxide solution, washed with water and carbonic acid. More than fifty such runs were made involving more than 100,000 gallons of water.

The results show that such material does remove the fluoride and that the purifier has a capacity of 266 grains per pound when water is passed through at the rate of one gallon per minute per square foot of surface area per ten inch depth. The average fluoride concentration of the effluent water was 0.42 parts per million. It requires approximately one pound of sodium hydroxide per pound of phosphate used for each regeneration. A slight loss of phosphate was noted.

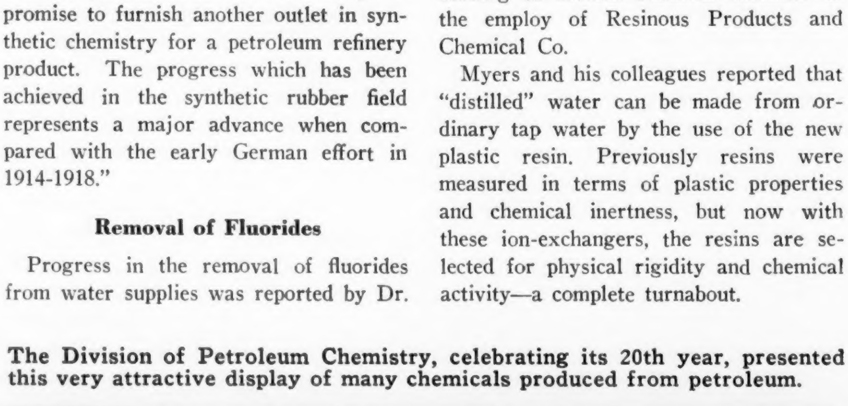
It is believed that the fluoride removal of waters of the Texas Panhandle area would be highly practical. Especially would this be true if the process were coupled with lime-soda ash softening which alone reduces the fluoride content to about 3 parts per million.

Plastic That Purifies Water

To the ever-growing list of plastic uses is now added the purification of water, according to several research chemists in the employ of Resinous Products and Chemical Co.

Myers and his colleagues reported that "distilled" water can be made from ordinary tap water by the use of the new plastic resin. Previously resins were measured in terms of plastic properties and chemical inertness, but now with these ion-exchangers, the resins are selected for physical rigidity and chemical activity—a complete turnabout.

The Division of Petroleum Chemistry, celebrating its 20th year, presented this very attractive display of many chemicals produced from petroleum.



St. Louis Municipal Auditorium proved to be a very commodious center for all of the meetings. Above, the registration desk where nearly 4,000 chemists and engineers received their identification badges and tickets for all events.

Credit for opening up this fundamentally new use for synthetic resins should go primarily to the Department of Scientific and Industrial Research of Great Britain. Their basic patents have been licensed to leading chemical manufacturers in Great Britain, Europe, and the United States, and commercial development is already making progress. In the United States the sole license has been granted to Resinous Products and Chemical.

Heretofore, natural and artificial silicates have been used in most water-purification equipment and while these inorganic materials are useful for "softening" water, they tend to increase its alkalinity and become saturated quite rapidly. Special resins of the phenol-formaldehyde type, on the other hand, can be tailor-made in order to remove selected impurities, have a greater purifying capacity and resist breakdown under the corrosive elements in the average water supply.

Known as "ion-exchange resins," the new materials are said to be of great value in reducing the formation of hard sediment in boilers, and eliminating "snowy" ice in artificial ice manufacture. Also, they are expected to be far superior for the purification of industrial waste which frequently contaminate drinking water sources such as rivers and wells, and they can also be used to recover valuable materials from such waste liquids.

The resins are being used in a variety of ways to effect recovery of minute traces of valuable substances, such as copper and zinc, from industrial effluents, and to remove traces of objectionable metals, such as iron, or traces of acids from commercial products. They are also used to remove inorganic salts from solutions in organic substances, such as the salts from sugar, proteins, enzymes, and other pharmaceutical solutions. This new development in synthetic resin chemistry offers wide opportunities for research and application in many fields.

Other New Developments

Dr. Norris D. Embree, Assistant Director of Research, Distillation Products, Inc., Rochester, N. Y., disclosed that new methods for separating the components of animal and vegetable oils are commercially practicable, although requiring the highest vacuums yet used in chemical technology. The process, "molecular distillation," has already contributed to national defense in that it has assured the country of a sufficient supply of vitamin A from American fish liver oils.

To remove the vitamins and sterols from oils it has been necessary, up to now, to break up the triglycerides with alkali to yield soaps, which are salts of the fatty acids, and then extract the vitamins and sterols from the soaps. By molecular distillation the vitamins and sterols may be directly distilled from the oil without harm to the triglyceride fraction which may then be used to make shortenings or oils for paints and varnishes. Vitamins A and D may be removed from fish liver oils by the same process.

Cottonseed Hulls In Plastics

Cottonseed hulls, a product resulting from the manufacture of cottonseed to obtain oil and protein feedstuff, may influence a lower level of values in plastics manufacture to make the use of such material inviting and economical in the displacement of metals, as aluminum to release the metal for more important employment in armament industries as a result of a research development by Dr. Fritz Rosenthal, University of Tennessee plastics technologist.

The cottonseed hull-phenolic molding composition is now in semi-commercial production at the Cotton Oil Laboratory of the University of Tennessee at Knoxville which supplies cooperating commercial custom molders with the compound in order to explore the commercial avenues of utilization.

Quick Vitamin B Test

A time, money, and labor-saving discovery which promises important nutritional advances for Americans as well as establishment of new agricultural and market standards for certain foods was reported by Chemists R. T. Conner and G. Straub of General Foods Central Research Laboratories, Hoboken, N. J. Chemists Conner and Straub announced a new method for combined determination of the amount of thiamin and riboflavin—important constituents of the vitamin B complex. This "test tube" method cuts the time for assay from several months to less than nine hours.

Nicotinic Acid Fortification

Dr. Bernard L. Oser, Director of Food Research Laboratories, Long Island City, N. Y., and his associates announced at the Symposium on Vitamins a chemical method which accurately measures the nicotinic acid content of both natural and fortified breads and flours.

More extended studies in the Food Research Laboratories have indicated that with the new chemical method it is possible to determine accurately the uniformity of distribution of the added anti-pellagra vitamin in bread ingredients such as flour and yeast, its fate during fermentation and baking, and how much remains in the finished product.

A Smokeless Fuel

Smokeless fuel for household use can be made from smoky coal by taking the smoke out, according to a paper on Disco delivered by C. E. Lesher, President of the Pittsburgh Coal Carbonization Co., Pittsburgh.

One of the important advantages claimed for this low-temperature process is that by using it a good smokeless household fuel can be made from many coals that do not have sufficient coking property for treating in high-temperature coke ovens. Many coals from the mid-continent coal fields as well as in the far West have been tested and have been found acceptable for use in this process.

Large Tar Yield

Using this process, there is no surplus gas for sale and by-products are limited to tar, of which there is a large yield, and light oils from the gas.

In the symposium on "Smokeless Fuels," several processes of low temperature carbonization were discussed. One among these, namely the "Hayes Process of Low Temperature Carbonization" has presented figures to indicate that because of the unusually high yield of tar by-products obtained in the operation of this process it is possible to produce a low temperature coke to be used as a domestic fuel at a price near to that price which the domestic consumer formerly paid for a good grade of high volatile bituminous coal.

New Products and Processes

By James M. Crowe, *Assistant Editor*

As a result of extensive research and tests the Hercules Powder Company has found that liquid esters of abietic acid may be used to obtain improved fluidity, flexibility, and impact resistance of asphalt, and also increased speed of penetration into felt, paper, asbestos and cellulose material.

The results obtained with these new products should be of interest to those in contact with the manufacture of shingles, felt base roofing, tar paper, insulating board, asbestos and cellulose board, felt base linoleum, mastic tile, or wherever the problem of impregnation with asphalt presents itself.

The addition of relatively small amounts of either Abalyn, liquid ester of abietic acid, or Hercolyn, hydrogenated methyl abietate, greatly increases the speed of penetration of asphalt into fibrous materials at any given temperature or permits the use of lower temperature for impregnation without increasing the time required. This property of the esters indicates the quality of the resulting impregnated shingle or board can be improved by the addition of a small amount of Hercolyn or Abalyn.

The increased fluidity and wetting properties which these solvents impart to asphalts indicates that increased adhesion between asphalt and stone and gravel used in road construction will result.

"The two materials," the company points out, "markedly lower the viscosity of a blown asphalt at temperatures above its melting point, and both wet cellulose fibers readily. The effect on viscosity is far greater than the reduction in melting point. Addition of 1% Hercolyn lowers the melting point of 206.1° F. asphalt less than 2%, while viscosity is lowered 18%; 7% Abalyn lowers the melting point 10% and viscosity in the molten state almost 60%.

Where a particular melting point is needed, the asphalt can be blown above the melting point desired and blended back. The addition of the materials will reduce the melting point to the desired figure, and the flexibility will be improved for the given melting point. Thus an asphalt treated with Hercolyn or Abalyn so that its melting point is equal to that of an untreated asphalt will show a greater impact resistance and be more flexible at lower temperatures.

Asphalt so treated also shows less susceptibility to cracking under shock at low temperatures. In order to test nearly identical samples, an asphalt, softening point 173.3° F. was chosen as the control; a portion of it was blown to a softening point of 187° F., and portions of these two were blended into a third sample with an intermediate softening point of 181.4 ° F. Addition of 4% Hercolyn to the 187 ° F. asphalt gave a mixture with a softening point of 172° F., 2% Hercolyn in the 181.4° F. asphalt gave a material softening at 173° F. The control and the two blends were then subjected to flexibility and impact tests by the following procedures:

These samples were subjected to impact breaking tests to determine the minimum height from which a 100-gram weight dropped on the specimen will crack it. At 15° F., untreated asphalt cracked at 70 cm., the 2% blend at 77 cm., and the 4% blend at 88 cm. Thus the resistance was increased 10% for the 20% blend and 25.7% for the 4% blend. Similar increases were also obtained at 30° F.

Flexibility was tested by the Reeve and Yeager Mandrel Breaking Point test using asphalts containing 2% and 4% Hercolyn. A 4" x 1" x ¼" strip of asphalt blend was bent around a 3/16" mandrel through 180° in 10 seconds, the temperature at which breaking occurs being recorded. The control asphalt breaking point was 19.8° F., that containing 2% Hercolyn 18.0° F., and that containing 4% Hercolyn 15.3° F., indicating a reduction of 9% and 27.7% respectively in breaking point. It should be emphasized that these blends containing varying proportions of Hercolyn all had the same melting point so that the results obtained can only be due to the incorporation of the Hercolyn.

Results of this nature indicate a highly blown asphalt could be so treated with Hercolyn or Abalyn to impart to it some of the physical properties of a mineral pitch.

Improvement in the speed of saturation of blown asphalt in strips of asbestos and felt were obtained by the addition of the materials. Results obtained from the addition of 1% to 7% Hercolyn and Abalyn showed that the addition of 1% yielded the greatest proportionate increase in speed of saturation, although additions of larger amounts further increased the saturation speed.

Using blown asphalt 180/200° F., addition of 1% to 7% of the materials decreased saturation time for felt from 11% to 33 1/3% while the saturation time of asbestos paper was reduced from 33 1/3% to 55%.

The susceptibility factor, as measured by penetration tests on 173° F., and 284° F. asphalts, is reduced as the percentage of liquid ester is increased. This indicates that asphalts modified with Hercolyn are less susceptible to temperature change than unmodified asphalts, since in every case the modified asphalts have a lower factor than the control."

New Plasticizer

The Resinous Products & Chemical Company recently announced the availability of a new material, Plasticizer C-24. This material is a cyclic ketone, a derivative of isophorone of high molecular weight, intended for use as a chemical, or solvent type plasticizer for coatings, plastics, cellulose derivative, etc., and as a softener for synthetic and natural rubber. It is characterized by high plasticizing efficiency, chemical inertness, high boiling point, low freezing point, and low vapor pressure. Some data follow to illustrate the properties of this plasticizer:

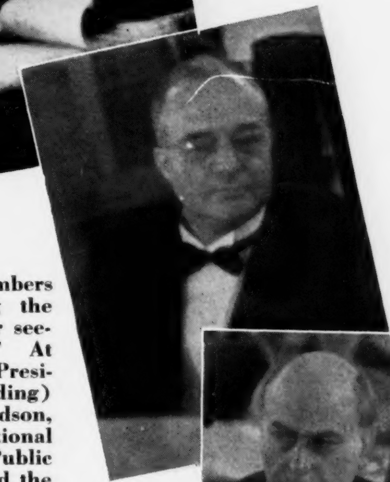
Distillation Range—96% between 200/230°C. @ 5 mm. Boiling Point (760 mm)—Approx. 410°C. (calculated). Freezing Point—below minus 60°C. Color—Less than 3 (Gardner-Holdt scale). Viscosity—Approx. 0.5 poises @ 25°C. Specific Gravity—0.875 @ 25°C. Pounds per gal.—7.5. Refractive Index—1.475 @ 25°C. Acidity—Negligible. Solubility in Water—Less than 0.1%. Solubility—water in C-24—Less than 0.1%.

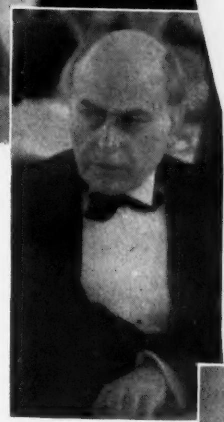
Work to date indicates its usefulness as a plasticizer for cellulose plastics and coatings as well as synthetic and natural rubber compositions where properties of permanence, low-temperature resistance and chemical inertness are required. It is also suggested for modifying lubricating oil, as a thread lubricant for spinning of textiles, a plasticizer for Nylon, a pigment dispersing agent and other similar applications.

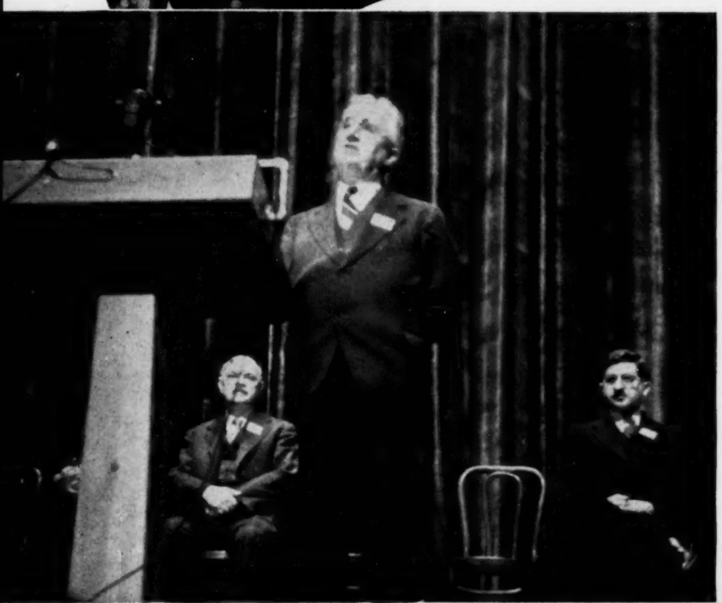
Witcarb

Wishnick-Tumpeer, Inc., has added a new inert to its list of materials for the production of paints, rubber and other products. The new member, called "Witcarb," is a finely divided, untreated, technically pure precipitated calcium carbonate. In tests and in actual use it is said to give such advantages in paints as lower cost per pigment pound, more gallons per pound, added texture in flats, and better stability in the finished paint product. Definite improvements in the properties of lithopone and titanated lithopone paints, and in some cases gloss paints and enamels are also said to result from the incorporation of the new product.

As a new white reinforcing filler for rubber, Witcarb is said to prove of value in improving results in formulas that require high tensile and modulus, and tear resistance. Among the specifications that make it effective for these purposes are: Specific Gravity, 2.680. Particle Size (microns), 2-3. Controlled pH, 9.0. Percent Residue (325 mesh), 0.114.







Above, left, A. C. S. members and their friends leaving the Municipal Auditorium after seeing "St. Louis Showboat." At the left, Dr. W. L. Evans, President of the A. C. S. (standing) and seated, Claude S. Hudson, Professor of Chemistry, National Institute of Health, U. S. Public Health Service, who received the Borden Award in the Chemistry of Milk, and Dr. David Rittenberg, Columbia University, who received the Eli Lilly and Company Award. Directly below, Dr. G. H. Morey, Commercial Solvents.

At the top, Hugh S. Taylor, Princeton, who spoke at the general meeting on "Catalysis Serves the Petroleum Industry." Thomas Midgley, Jr., Ethyl Gasoline Corp., and Chairman of the A. C. S. Board of Directors. At the meeting it was announced that he is to receive the Priestley Medal. Walter A. Schmidt, Western Precipitation, and an A. C. S. Director.

At the left, some distinguished visitors measure th "pU" value (breath odor) on Norwich Pharmac "osmoscope." Below, at the left, Dr. Berl, "Carne Tech" and Dr. Arthur B. Lamb, Harvard University a former A. C. S. president. Directly below, M Joseph S. Battley, Chief, Occupational Deferment, Se tive Service System.

CHEMICAL TOM SAWYERS ON

101st MEETING AMERICAN CHEMICAL SOCIETY

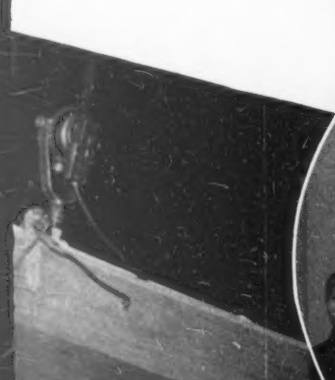
SCENES of old Mississippi days, of Mark Twain, Tom Sawyer, Aunt Polly, white-washed fences, "darkies" singing and smoke bellowing from the stacks of racing steamboats were revived last month by the St. Louis Section for the entertainment of 4,000 of America's chemists, engineers and industrialists gathered together in one of the country's most critical periods. Early arrivals enjoyed, on Sunday evening, the moving pictures "The River," "Tom Sawyer," and "Huckleberry Finn." On Monday evening "St. Louis Showboat" was staged on the mammoth Auditorium stage. But nostalgic thoughts gave way in the business and scientific sessions to discussions and reports dealing with the chemical industry's part in national defense plans of the country.

Hugh S. Taylor, ho spoke at the ing on "Catalysis Petroleum Indus- as Midgley, Jr., ine Corp., and f the A. C. S. irectors. At the as announced that eive the Priestley lter A. Schmidt, ipitation, and an ctor.

hed visitors measure their on Norwich Pharmacal's e left, Dr. Berl, "Carnegie mb, Harvard University and t. Directly below, Major upational Deferment, Selec-

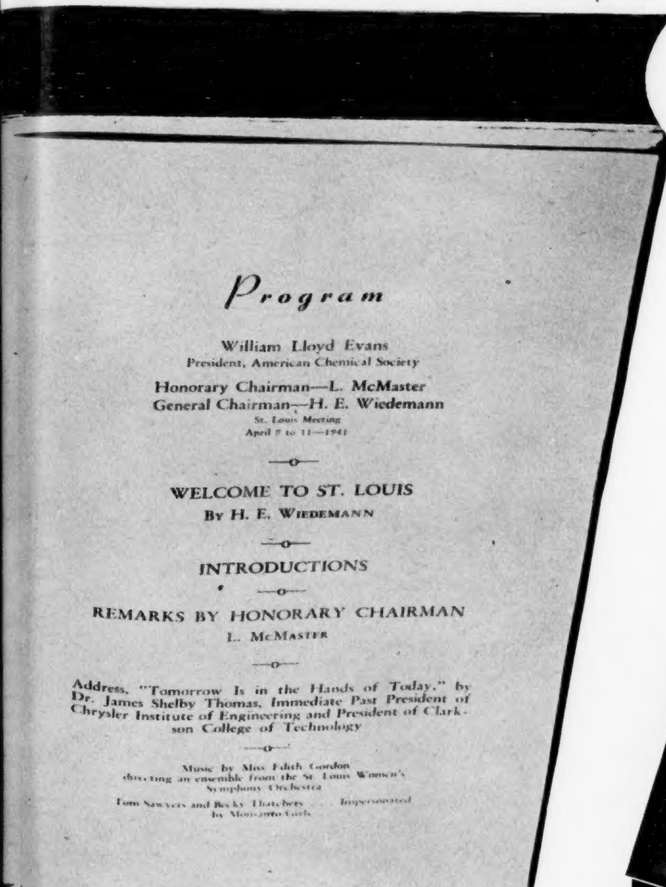
Above, left to right, Charles H. Ellaby, U. S. Army Engineers, Upper Mississippi Area; Dr. H. DeLaszlo, L. Light & Co., Wraysbury, England; Dr. C. W. Rippie, Solvay Sales; and Dr. R. Rosen, Chemical Division, Esso Laboratories. At the left, S. Cohen, Amecco Chemicals, Inc., Rochester. Below, the speaker at the dinner, Dr. James Shelby Thomas, President, Clarkson College of Technology.

At the right, inspecting Chemical Industries' Exhibit, "New Chemicals for Industry," Dr. George Moore of the Stamford Laboratories of Cyanamid. Below, the "Wilkinsons" but not related. Dr. J. A. Wilkinson, Iowa State, and Dr. P. D. Wilkinson, Indiana State Teachers College.



MARK TWAIN'S MISSISSIPPI

ST. LOUIS AUDITORIUM, APRIL 7-11, 1941



Program

William Lloyd Evans
President, American Chemical Society

Honorary Chairman—L. McMaster
General Chairman—H. E. Wiedemann
St. Louis Meeting
April 7 to 11—1941

—o—

WELCOME TO ST. LOUIS
By H. E. Wiedemann

—o—

INTRODUCTIONS

—o—

REMARKS BY HONORARY CHAIRMAN
L. McMaster

—o—

Address, "Tomorrow Is in the Hands of Today," by Dr. James Shelby Thomas, Immediate Past President of Chrysler Institute of Engineering and President of Clarkson College of Technology

—o—

Music by Miss Edith Gordon directing an ensemble from the St. Louis Women's Symphony Orchestra

Tom Sawyers and Becky Thatchers .... Impersonated by Monsanto Girls

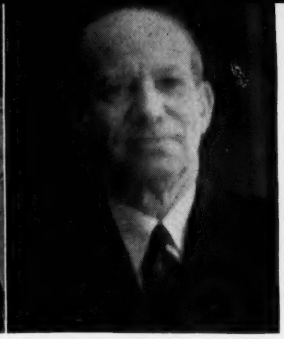
Below, All
and C. D.
Below, Dr.
J. Moore,
the girls f
Hulda Hall

Directly above, a group of Monsanto executives. Top, Gaston F. DuBois, Frank J. Curtis. Below them, C. Barbre, William G. Krummrich, and at the left, Howard Marple. Above, right, Dr. M. G. Mayberry, Mellon Institute.

Left, A. C. Elm, N. J. Zinc. Above, Charles L. Gabriel, Commercial Solvents. Below, Dr. J. J. Dunleavy, General Chemical, and Dr. L. W. Bass, Mellon Institute.

Above, at the left, J. H. Brown, C
Right, Dr. H. C. Gore, Standard B
W. Zerban, N. Y. Sugar Trade L
Chemicals for Industry." Left, M
the souvenirs at the dinner party.






Starting at the left, Dr. Harry L. Fisher, U. S. Industrial Alcohol; Edmund G. Bordon, Cities Service Oil; Arnold D. Alt, Mallinckrodt Chemical; Arnold Kirkpatrick and Dr. F. D. Smith both of Monsanto. Below, at the left, Dr. H. A. Lubs and Dr. Walter Lawson, both of DuPont. At the right, Melvin E. Clark, Michigan Alkali; and Dr. D. E. Babcock, Owens Corning Fiber Glass.





Below, Albert Hovey, Reichhold Chemicals, and C. D. Goodale, Commercial Solvents. Below, Dr. Archie J. Weith and Dr. Robert J. Moore, both of Bakelite. At the right, the girls from Monsanto, and below, Miss Hulda Hall, who impersonated "Aunt Polly."

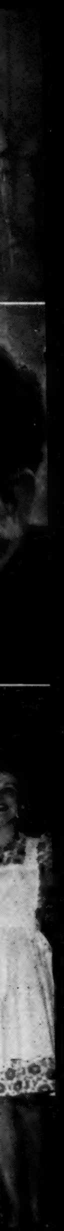
C. H. Swanger, U. S. Bureau of Animal Industry, gets $64 from Bob Hawk, "Take It or Leave It" program, below.

Top,
bre,
ple.






, at the left, J. H. Brown, Oldbury Electrochemical. Dr. H. C. Gore, Standard Brands, and Dr. Frederick erban, N. Y. Sugar Trade Laboratory, inspect "New icals for Industry." Left, Monsanto girls distribute uvenirs at the dinner party.



ORDS OF SERVICE WITH
ACE RUBBER PROTECTED
EQUIPMENT

ACE RUBBER LININGS GIVE YOU...

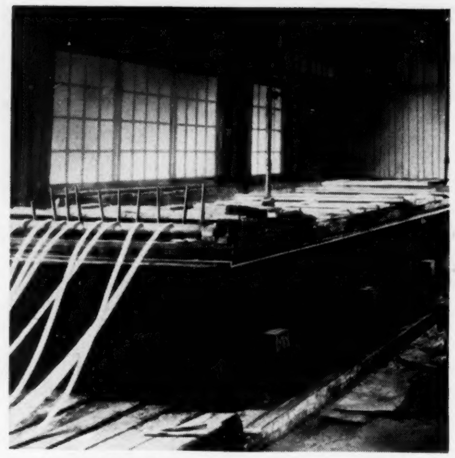
PROTECTION... against corrosion and contamination.

TEMPERATURE RANGE... wide temperature range, in many instances at the boiling point of water.

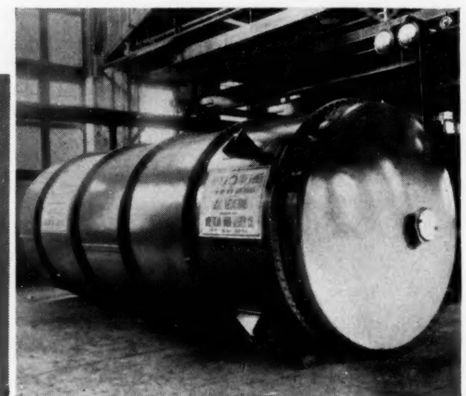
SPECIAL COMPOUND... to meet the requirement of your particular service.

SURFACE... non-porous, smooth, easily cleaned.

SERVICE... applied to all types and sizes of tanks, tank cars, pipe, pipe fittings, valves, pumps, etc.



Ace rubber lined strip pickling tank. Dilute sulphuric acid.



Ace rubber lined bleach storage tank 8 ft. dia. by 23 ft. 9 in. long (6 sections). Dilute chlorine solution.

INDUSTRY Metal.
SALESMAN 63
PHOTO NO.
DATE 4/3/39

78"

INDUSTRY Textile
SALESMAN 65
PHOTO NO.
CUSTOMER'S NAME [redacted]
INSTALLED AT [redacted]
CUST. ORDER NO. A. H. R. ORDER NO. B-33693 DATE 1/15/40
DESCRIPTION OF EQUIPMENT: Soft rubber lined steel tank 10' dia. x 17' long with dished heads, manhole and ejector pipe
GENERAL SERVICE: storage
SOLUTION: hydrochloric acid
CONCENTRATION:
LOCATION, INDOOR OUTDOOR X
TEMPERATURE, MAX. MIN.
PRESSURE OR VACUUM, IF ANY
REMARKS: This tank is used for the storage of hydrochloric acid for the Kemgas process of removing lint from cotton seed, in order to aid germination.
USE OTHER SIDE FOR

tank. Tanks for process-
ng, plating, etc. may be
ETY.

Ace rubber lined ammonia storage tanks. Eliminates metallic contamination.

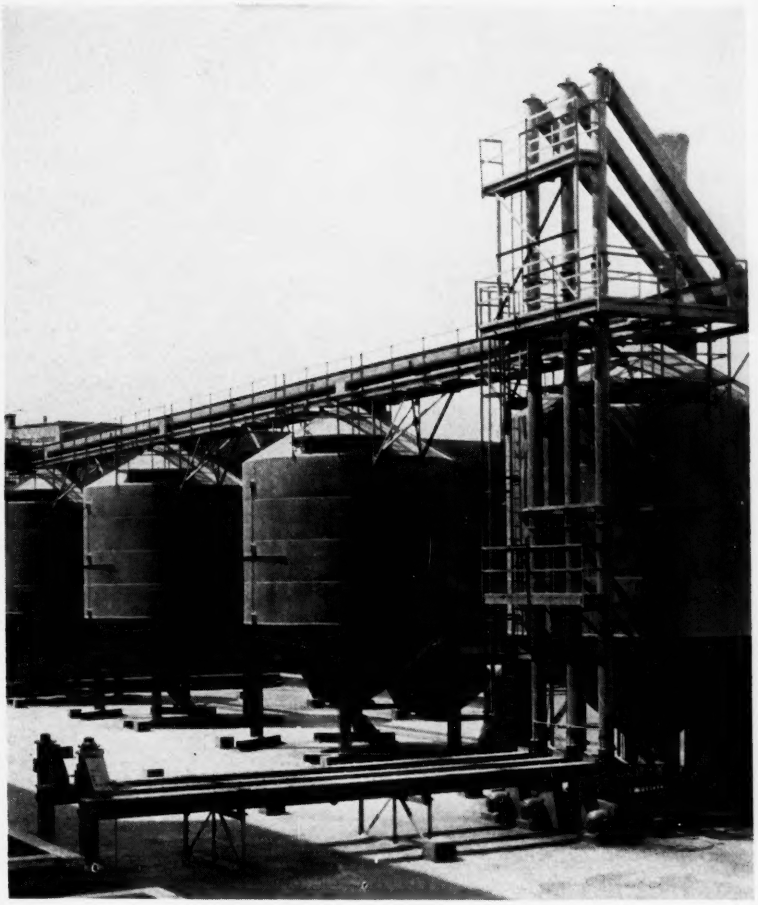
INDUSTRY Chem.
SALESMAN 64
PHOTO NO.
CUSTOMER'S NAME [redacted]
INSTALLED AT [redacted]
CUST. ORDER NO. 15333 A. H. R. ORDER NO. B-16814 DATE 8/17/38
DESCRIPTION OF EQUIPMENT:
Hard rubber lined tank 5' dia. x 5'3" deep
GENERAL SERVICE:
SOLUTION: Highly acidified ocean brine solution with traces of free halogen at 75° C
CONCENTRATION:
LOCATION, INDOOR OUTDOOR
TEMPERATURE, MAX. MIN.
PRESSURE OR VACUUM, IF ANY
REMARKS:
USE OTHER SIDE FOR SERVICE REPORTS.

A DIG

ING ....tough-pliant ACE

R STREET NEW YORK, N. Y. · AKRON, OHIO · CHICAGO, ILL.

PLANT OPERATION AND MANAGEMENT



Conveyor for Carbon Black

Photo shows Link-Belt screw conveyor, made by Link-Belt, Chicago, in operation at a rubber goods manufacturing plant. System is a rotor lift elevator and conveyor for unloading and storing bulk carbon black.

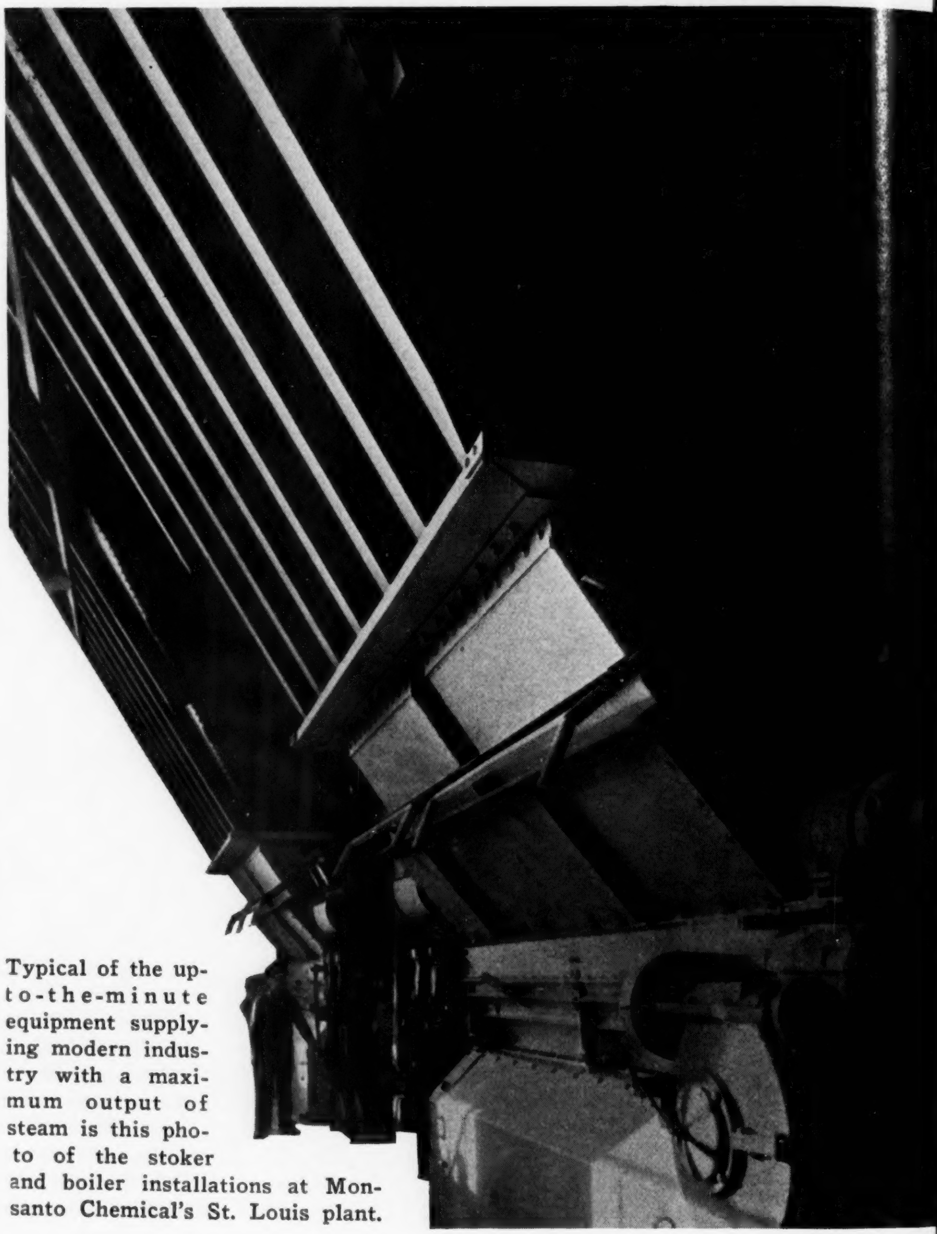
A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

CHEMICAL INDUSTRIES

INSTRUMENTS AND CONTROLS
Increase Boiler Output

By Charles W. Parsons
Republic Flow Meters Co.

At last month's Mid-West Power Conference, sponsored by the Illinois Institute of Technology in Chicago, the author delivered this paper before the Industrial Power Plants Section. In it will be found the "whys and wherefors" of maximum boiler plant efficiency



Typical of the up-to-the-minute equipment supplying modern industry with a maximum output of steam is this photo of the stoker and boiler installations at Monsanto Chemical's St. Louis plant.

THESE present direct and indirect demands of National Defense for many more goods of all types are increasing the demand on both industrial and utility power plants. These demands make it essential that every boiler be able to produce its maximum output of steam and that this output be most reliable.

Let us consider just two of the many classes of equipment which make up the modern boiler plant: Instruments and Controls. The need for instruments and controls applies to the entire range of boiler sizes from the smallest industrial plant to the largest central station. These boiler sizes merely measure the degree of importance of instruments and controls and the number worthwhile in the particular plant.

Instruments provide the necessary guide for operation and the record of each operation and its results.

Automatic controls maintain boiler steam pressures, steam flows, draft conditions, steam temperature, gas temperatures and combustion efficiency more accurately than could an excessively large staff of operating engineers.

Modern boilers and auxiliaries deserve and require more than "rule of thumb" operation. The modern boiler plant is operated just like every other efficient department of modern industry with careful measurements of all raw materials received and of all finished products produced. Boiler room instruments and the tabulation of the measured quantities accomplish the same results as the inventories of raw and finished products and the time sheets in each department of every industry.

Only by knowing "what goes on here" can the head of any department know "what goes where" and spot the inefficiencies and correct them. That is particularly true in the boiler room where most quantities flow along through pipes and cannot be seen or counted except with accurate instruments. Highly accurate meters of all types are available from a number of well known manufacturers for the exact measurement of every important condition which should be watched to obtain highest efficiency and dependability of boiler plant operation. Nothing need be left to guess. You can't improve conditions until you know what they are.

Eliminating these inefficiencies in boiler plant operations, obviously increases the output possible from any existing boilers and auxiliary equipment. Just as in our automobile, if defective spark plugs are spotted and replaced, our same automobile with the same number of gallons of gasoline can carry us and our load a greater number of miles. The investment in checking those spark plugs pays a nice return. Likewise, the investment in instruments to provide continuous check and records of all important operations in the power plant will pay big dividends in fuel savings, in prevention of unexpected shut-downs and in the ability of that plant to produce a greater output.

Top management will probably ask us where these aids to greater reliability, great efficiency and greater capacity are hiding. Most operations in the modern

boiler plant involve uses of fuel, steam, water and power. In almost any case these quantities can be slightly or substantially reduced by giving the operator exact information of the amounts of these quantities being used and produced. Only a few of the more important can be considered here.

Burning the fuel in the boiler is obviously the greatest consumption of dollars. This is a substantial amount on the books for a small plant and it is a huge number of dollars in the larger industrial and central station boilers. As in the automobile carburetor, a boiler is the means of mixing an amount of fuel with the proper proportion of air and burning that particular fuel most efficiently. If our carburetor is set too lean, difficulty is encountered in starting our car. If the carburetor is set too rich, there is an unnecessary waste of gasoline and best performance is not obtained.

Check Fuel Mixture

In the boiler, therefore, the first thing is to know whether our fuel-air mixture is too lean or too rich. This can quickly and accurately be determined by several highly satisfactory boiler meters. These are divided into two classes. The direct analysis type of boiler meter provides records of this fuel-air mixing in terms of per cent of CO_2 in the exit gas. One well known make of boiler meter employs a second principle, namely the comparison of the air-flow through the boiler with the amount of steam being produced by the boiler. This is the indirect method of measuring combustion efficiency and is called the steam flow-air flow meter. Either the direct or the indirect type boiler meters are used on most modern boilers. Each has its advantages and either provides this most important boiler room record and guide to greater output and dependability.

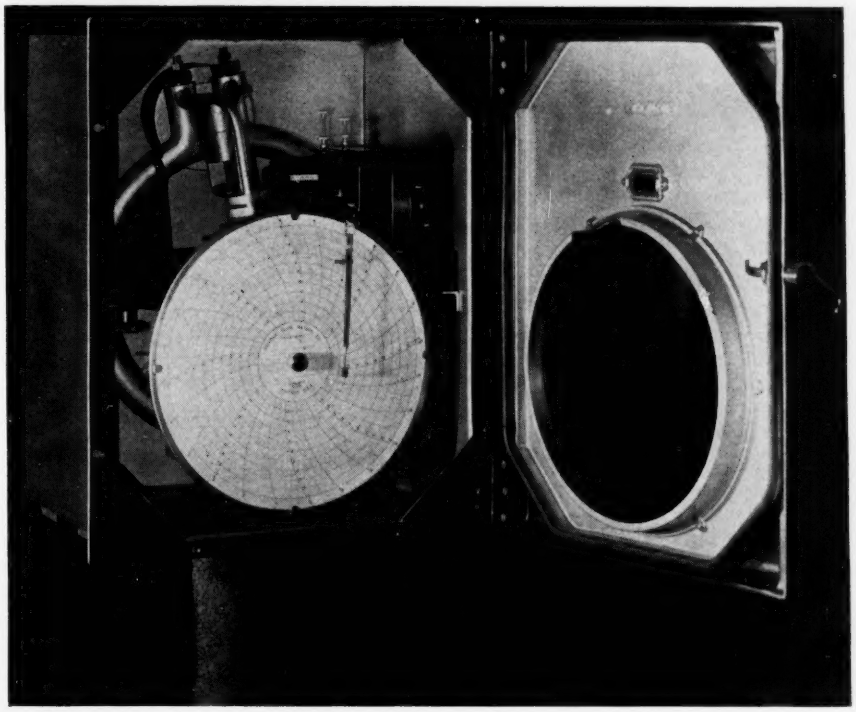
No two coals, and certainly no two different fuels are sufficiently alike to make definite promises practical. The following improvement would result in many coal fired boilers and similar savings would apply to burning other fuels. If a boiler were being operated to burn coal in such a way that an eight per cent CO_2 existed in the boiler exit gas, that would mean a preventable loss (not a total loss) of $115.00 for each $1,000.00 of coal burned. Burning this same fuel with a fourteen per cent CO_2 flue gas would reduce this preventable loss to about $15.00. This is a saving of $100.00 for each $1,000.00 worth of coal burned. This ten per cent is a lot of dollars in the coal bill for any boiler plant, large or small. Various boilers have been found operating at even less efficient conditions than represented by this eight per cent CO_2. Smaller increases in efficiency of burning result in correspondingly smaller savings. A combustion meter could thus pay for itself in quick time.

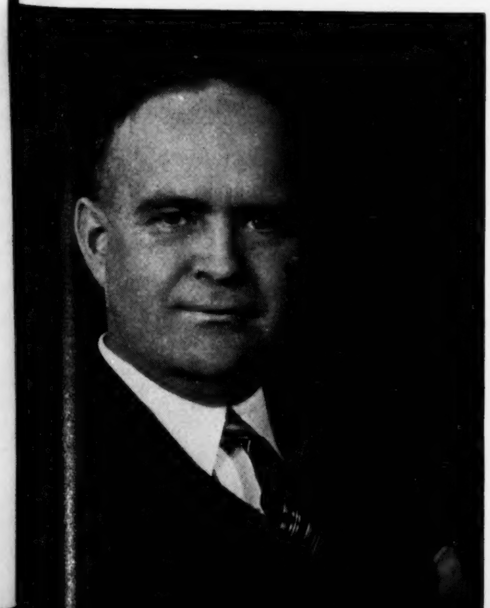
While steam flow meters may not point out as large possible savings as will a combustion meter, the steam flow meter is indispensable as it provides a continuous indication to the operator, plus a permanent record, of exactly the amounts of steam generated at all times, and it furnishes an accurate total of the steam generated over any definite period. Accurate measurements of fuel are provided by weighing cars of coal and metering flows of oil and gas, so that this accurate measurement of the steam output of the boiler is the basic check on the amount of steam produced per unit of fuel. This steam meter warns the operator instantly when the steam flow drops below the capacity of the boiler when maximum output is needed. It aids the operator in so many ways in balancing the load between several boilers, in catching peaks of steam loads and in anticipating necessary changes in firing a long time before the pressure may have dropped sufficiently to be noted by operators of a manually fired boiler.

Draft indicators are a most important and useful guide to boiler operation and enable the operator to note at all times the draft available and the draft losses through the several parts of the boiler, fans and air heaters. Reduction in fan output, leaks in baffles, slagging of boiler and superheater tubes and the silting of other passes of boiler, economizer and preheater can be quickly detected by alert operators watching the indicators of the draft in the several portions of the boiler.

Temperature recorders serve to flash danger signals when temperatures vary excessively from the standard for any normal operation. Among the inefficient conditions reducing boiler output and jeopardizing continuous operation, which are shown up by the temperature recorders, are the slagging or silting of the outside of boiler tubes and the scaling of the inside of these tubes; all of which result in less absorption of heat by the water and excessive loss of heat up the stack. Baffle conditions, superheater changes and inefficiency in air heaters and economizers likewise show up on the temperature chart. Temperature records of feedwater, steam and many other fluids in the boiler plants are likewise essential.

Meters on the boiler applications we





Left, the author, Charles W. Parsons. Above, a complete mechanical ring balance meter with door open to show accessibility of all adjustments from the front. This equipment is manufactured by Republic Flow Meters.

have just discussed are only a portion of all the meters and instruments around a boiler plant. Many additional flows, pressures and temperatures must be obtained to insure that the high efficiency maintained in the boiler itself will not be offset by unnecessary losses in turbines, pumps, heaters and the formidable battery of auxiliaries which are necessary to get the last B.T.U. of the fuel converted into useful power. Some of the most important steam flows to be metered are to steam turbines, bleed steam from turbine to each intermediate pressure header, exhaust steam for heating water and plant heating plus steam for process. Feedwater is always measured and is frequently subdivided into return condensate and make-up water.

Distribution meters usually increase the capacity of existing boilers in a different way. They put the finger on unnecessary uses and excessive waste of steam after it leaves the boiler room and cause these wastes to be eliminated. This additional boiler capacity is then available for actual steam needs rather than for supplying wasted steam. The ancient, and still used, practice of charging fixed percentages of the total steam cost to certain departments offers no help in spotting the dollar leaks. It gives the head of each department no incentive for eliminating these leaks. It is human nature to blame the excessive use of steam, water, heat and light on the other departments when it is admittedly an arbitrary spreading of costs. When accurate meters are installed on each of these lines, there is no way of dodging the fact that a particular department used a definite number of dollars worth. The department head then immediately finds out where the excess is going and stops as much of the waste as is possible. These important distribution meters are frequently mounted on a central panel in the boiler or turbine room for the quick reference of the operating engineer, as he then knows exactly the amount that each department is using at any particular time.

In spite of the proof that meters will increase boiler output and make substantial savings in fuel cost and in steam and power used, there is one condition where meters cannot make these savings. That condition is where no attention is paid to the readings of these meters and their signals of inefficiencies and losses. In other words, meters will not increase capacities and will not save a dollar unless the information they furnish is intelligently used.

Automatic controls are recognized as essential in operating modern boilers. Automatic control is practically indispensable for the larger boilers with their improved firing equipment, their forced and induced draft fans, possible air heater and superheater bypass features and the many auxiliaries contributing to their efficient operation. With few exceptions, the great majority of modern boilers from the small industrial plant to the largest central station are equipped with automatic controls of the principal features.

The relatively small boilers of a few hundred horsepower are proving to be considerably more efficient and to be capable of continuous operation at higher capacity with automatic control than without it. Several manufacturers have developed highly dependable controls of proven performance at a cost to make them a profitable investment in even these smaller plants. Automatic controls can accomplish no more than a sufficiently large number of capable operators and engineers. This statement may sound out of place in a discussion of automatic combustion control, but the best automatic combustion control system is not superhuman.

Automatic Control Cheaper

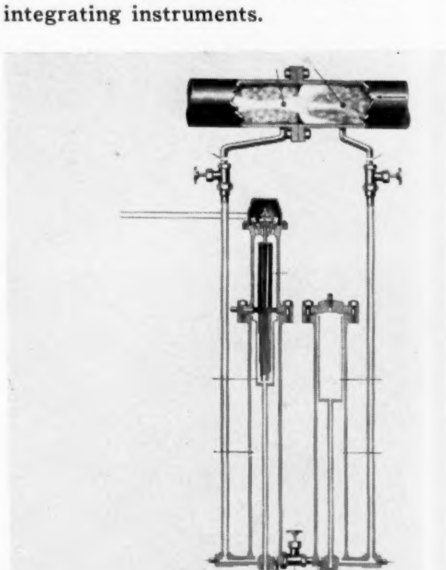
It merely is capable of such close adjustment, such high accuracy of measurement, such speed of operation, together with such stability, that it can detect the slighest changes in steam pressure, fuel-air ratio, water level, steam flow and other controlled conditions. It can inaugurate and complete the necessary steps to correct that change long before the change would be perceptible to an attentive operator. Nevertheless, a crew of several men, one standing continually at each fan, fuel feeder, damper and valve could be trained to respond sufficiently fast to the instructions of a supervisor or an instrument watcher so that if they did their job perfectly, they could obtain results approaching those of the best automatic control. The cost of such a large staff of men would be prohibitive, of course, and be many times the carrying charges of the finest automatic control.

Safety, dependability and efficiency are three of the most important contributions made to a power plant by automatic controls. While safety is the most important of all, dependability means so much in both central stations and industrial plants, whether normally or in these times of intensive defense business. The increased efficiency which will unquestionably result from this closer automatic control will probably pay for the equipment in a relatively short time. It is the instantaneous, smooth controlling of the many boiler devices simultaneously, which insures this safety, dependability and efficiency. Observing the functioning of any good control system on a moderate sized boiler will impress any engineer with the remarkable coordination of many operations which is accomplished by a modern control system. These functions of sensitivity of measurement, speed of response and power of operation are incomplete without the ability of the control to stabilize these operations. This lack of hunting and over-travel of the regulating devices is essential to good control.

The control of the steam pressure in the boiler plant header is the primary function of most automatic combustion control systems. This pressure is the measure of the supply of steam available and the measure of the greater or less quantity to be generated by the boiler. This maintenance of constant steam pressure increases the efficiency of the turbines and other power units. Variable steam pressure upsets many plants and process operations and affects some special products seriously.

The control of the fuel-air ratio is just as important as the control of constant steam pressure. In terms of our automobile carburetor, this combustion control automatically maintains a definite mixture of fuel and the air for burning it throughout the entire range of the boiler and equipment being controlled. It can be described as a control system designed to supply the necessary fuel to maintain constant steam pressure and the exact measured quantities of air for the correct combustion of that varying amount of fuel. This ability of the leading combustion control systems to automatically supply the exact quantities of both fuel and combustion air makes such a system almost indispensable in the medium and largest size boilers. This is particularly true where the rapid changes of load would make hand control of these quantities

Below, cross section of an electrical type Republic flow meter. Mercury in meter fluctuates with changes in orifice differential pressure to operate remote indicating, recording and integrating instruments.



difficult and tardy. These systems provide a convenient adjustment by which the operator may instantly reset this fuel-air ratio should the combustion meter show any changes in fuel or boiler conditions. One or more manufacturers offer a device for automatic correction of this fuel-air ratio. The merits of such an automatic corrector can be balanced against the advisability of holding the boiler operator responsible for attention to the results of combustion and the occasional shading of this adjustment, if he deems it advisable.

The control of the furnace draft in a boiler is a part of the combustion control system. This regulator is not actuated from the master as are the fuel and airflow regulators, but is free to vary the supply of air for the furnace as it is needed for combustion. The better furnace draft regulators are capable of controlling dampers, fan speeds, etc., to maintain this furnace draft within limits of one or two hundredths of an inch of water pressure. The importance of this furnace draft control is appreciated by all engineers, particularly those who have experienced destruction of furnace refractories because of too high a furnace pressure. In the smallest boilers where complete combustion control may not be economical, the control of the furnace draft is usually the least expensive and the most valuable single step towards good combustion, low furnace maintenance, and maximum continuous steam production.

Various fuels require individual arrangement of control for supplying proper quantities to the furnace. Fuel regulators will operate valves in the oil or gas lines to oil and gas fired boilers. Accurate ratios of fuel and air can be obtained in these cases by equipping these fuel regulators with flow measuring devices so that the correct measured quantities of air will be supplied to burn measured amounts of fuel. Various designs of stokers take individual arrangements of fuel regulators to provide quickest feeding of coal. In all cases the fuel quantity is varied in accordance with the steam demand, usually through the master controller on the instrument and control panel.

The control of the various pulverizers is an interesting study in itself. Basically the fuel regulators perform two functions, namely actuating the feeder to supply proper quantities of coal to the mill, and then controlling the rate of coal and primary air being supplied to the burners. In certain cases coal is fed by a regulator which maintains constant level of coal in the mill. One type of mill operates best with a separate mill suction regulator. Another type of mill frequently uses two dampers in addition to the feeder control, all actuated by a single regulator. All arrangements accomplish close regulation of the quantity of coal being burned, and insure reliability of operation.

Burning multiple fuels in many industrial and some central station boilers present interesting problems of control. As an illustration, some modern refinery power plants burn refinery gas in whatever quantities it is available, also burn fuel oil in quantities varying as available and at the same time burn pulverized coal. These three fuels can all be automatically controlled and a total quantity of air supplied to the boiler in exact measured proportion to the requirements of each of the three fuels in whatever varying amounts they reach the burners. The same simple and rugged devices which have proven so successful in measuring these multiple fuels and controlling total air to the burners are used for similar accurate control of the total air when two or more pulverizers are used on a single boiler.

Water Level Control

Water level control is used on practically every boiler above the smallest. These controls are of several types from the simple float to the highly sensitive mercury differential design. All operate a valve in the feed line to maintain constant water level. Several level controls supply feed water to the boiler in proportion to the steam output and then make any necessary correction from water level measurement. Close control of boiler water level is an important aid to sensitive control of steam pressure, and another guarantee of reliable boiler performance

The control of the excess of feedwater pressure over the steam header pressure is a further aid to good feedwater level control and is employed on turbine driven pumps on high pressure boilers. A saving in pumping costs is made by holding this pump pressure down to a fixed excess over the steam pressure. Another advantage of this constant excess pressure across the feedwater level regulating valve is keeping this valve in its most efficient operating range. Pump bypass control is used to prevent overheating of high pressure centrifugal pumps when operating at low flows of high temperature feedwater.

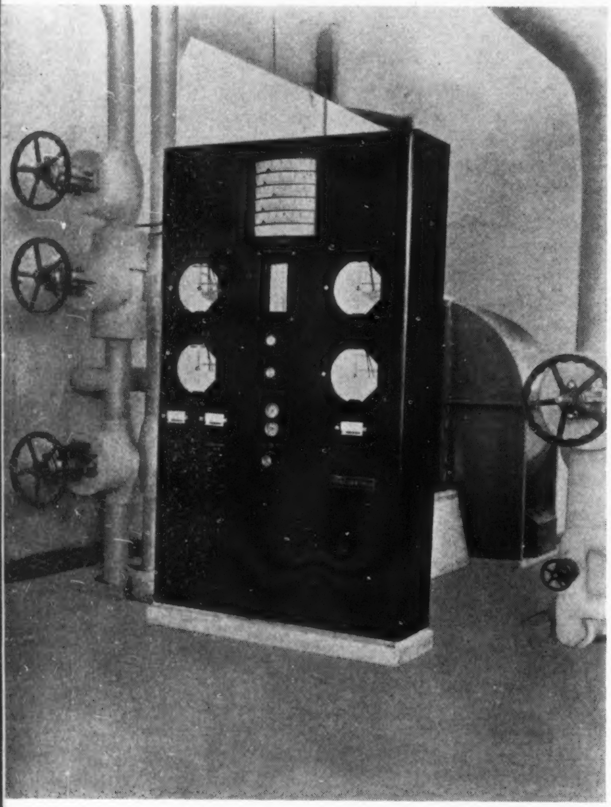
Pressure reducing stations are an important part of all topping installations where a new higher pressure boiler is added to an existing station, and where it is necessary to reduce that higher pressure steam for use in the existing low pressure generating and auxiliary units and pipe lines. It is in such installations that high pressure steam at 600#, 900#, 1300#, and 2400# is suddenly available in very large quantities when a large high pressure topping turbine suddenly cuts out. Such a regulating job not only requires a specially designed valve for these high flow, temperatures and pressures, but also requires a regulator of unusual characteristics to be able to open, say a 12" valve in one or two seconds and yet have that valve under such accurate, sensitive and stable regulation that the resulting steam pressure will be held within a few pounds, regardless of the flow.

Desuperheating stations are almost always required in conjunction with pressure reducing stations to supply sufficient water to the high temperature steam to reduce the temperature to that which is safe to supply through the older piping to these older generating units. Among the common types of desuperheaters are the following: The cartridge and similar types use a large separator operating on the principle of spraying an excess of water into the steam and then removing the water not needed by a suitable trap. The atomizing type of desuperheater uses high pressure steam for completely atomizing the water being injected into the steam line, and is particularly effective over a wide range of flows. A temperature measuring element and controller actuate the water inlet valve. Where sudden flows of very large quantities of high temperature steam occur, as on a topping turbine bypass, the temperature controller types may be slow. For those installations two types have been used extensively. Both of these are actuated directly from the differential pressure created by the flow of this steam through a venturi throat. One type employs a large drum of water and is arranged so that the differential pressure itself injects the proper quantity of water into the steam. The second type impresses this same venturi throat differential pressure on a sensitive measuring element of a regulator which operates the valve admitting water to this venturi type desuperheating nozzle. Here again it's the reliability of this control equipment that is of paramount importance.

Returning to the subject of meters for just a few moments, let us summarize briefly the general classes into which most flow meters can be divided. Each of these classes can be supplied by manufacturers with many years experience and each has its technical or financial advantages for a particular measuring job.

The most common type of flow meter is a mechanically operated float or bell and in almost all makes this is actuated by a differential pressure across an orifice plate or other measuring elements in the flow line. This meter employs the usual mercury U-tube principle of measuring the rise or fall of mercury as the measure of this differential pressure and flow. It is necessary merely to transmit this float movement to the recording pen and to the indicating and totalizing mechanism. Each make of meter endeavors to accomplish this with least error from friction loss in the float and instrument mechanism.

The electrically operated meter computes the flow by measuring the rise or



Above, Republic-Smoot boiler control and instrument panel for one of three 76,000 lb. per hour, 650 lb. pressure boilers in a large Southern paper mill.

fall of mercury in a U-tube and transmits this measurement electrically to the recording, totalizing and indicating instruments which may be located at any remote point. This type of meter was developed over 25 years ago and the present Republic electric meter is a modern illustration of the success of that type. An advantage is the ability to locate the instruments at a central control point where this information is of greatest value, such as in the engineer's office or on the boiler control board. An additional advantage of this type is the freedom from floats and other moving parts. Several manufacturers have their own variation of this original electrically operated meter.

One of the latest commercial adaptations of an old metering principle is the ring balance meter now being offered by more than one manufacturer. This is merely a simple ring accurately balanced on suitable bearings so that the differential pressure across the orifice or other medium is brought to a partition in the ring and tilts the ring in proportion to that differential pressure. An outstanding advantage of this new type is that the fluid being measured is confined entirely inside this ring and cannot come into contact with any other parts of the meter. This ring balance meter is available to operate the instruments either mechanically or by remote electric transmission.

Combustion meters are of great importance in checking boiler and other combustion conditions and are probably the instruments which make the greatest return in fuel savings. Certainly they are the guide to obtaining greatest increase in boiler output for defense and other purposes. These combustion meters can be divided in two general classes, direct and indirect.

The CO_2 meters are the direct type of combustion meter and have been manufactured by several companies for many years. Time is too short to discuss the relative advantages of the various types, but all engineers will agree that any meter which will provide accurate records of CO_2 in a dependable manner without excessive maintenance is exactly what they need to give them a direct measure of the efficiency of burning fuel.

Steam-flow Meter Popular

The steam-flow, air-flow meter has been manufactured by one of the leading meter companies for many years and is the favorite boiler meter of many operating engineers. This steam-flow, air-flow meter supplies an indirect measure of the combustion conditions by comparing two records. One record is the air flow through the boiler, the other record is the steam flow from the boiler.

Draft gauges are supplied by several manufacturers in either single unit indicating cases or in multiple unit cases. While the draft recorders are also available, the usual practice is to record the temperatures and the results of combustion and to use indicators of these various drafts as a guide for the boiler operation. These gauges may be either of the oil sealed bell type or the slack leather diaphragm type. One manufacturer has recently standardized on a multiple draft indicator which provides each indicator in a unit case individually removable from the assembly of indicators.

Recording thermometers, recording pyrometers and recording pressure gages are available in various styles. Basically the thermometers and pressure gages are a gas, vapor or liquid filled helix which actuates a pointer or a pen arm as it expands or contracts with increase in pressure. Pyrometers are standard for measuring higher temperatures and are preferred by some engineers for certain lower temperature applications.

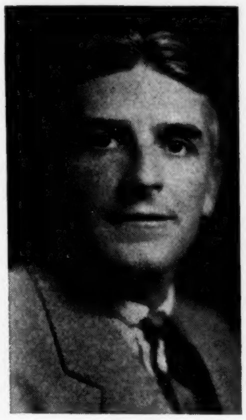
Multiple pen recorders are available in both the round chart and strip chart types, providing more than one record on a chart, thus giving the operator a condensed record of several operations. One manufacturer supplies wide strip charts divided into three sections with two pens per section to avoid congestion of records. Other manufacturers supply various colored recording pens and printed numerals to distinguish between the several records.

A comparison of the combustion control systems would be a study in itself. They can be classified as air operated systems, oil operated systems and electric systems. Of the advantages claimed for each, the electric requires no air or oil supply for its operation. The oil system, while requiring both oil supply and oil return pipe lines, uses a non-compressible fluid and perhaps is faster for certain control problems requiring instantaneous operation. The air operated systems have been selected for a majority of the modern combustion control installations and are offered as standard equipment by at least three of the largest combustion control companies. Some of the advantages of the air system are: several minutes air supply available after interruption of electric power; ease of installation with single copper tubing air supply to each unit; operation from existing plant air supply, plus the sensitivity and stability and reliability made possible by present designs.

Let us merely list the principal features which are desired in any regulating system and for which any individual system under discussion should be checked. These are reliability of operation, accuracy of measurement, sensitivity to changes, speed of operation, power to move the controlled device and above all, complete stability and freedom from hunting and overtravel. The master controller should include a device to correct for the boiler characteristics to assure control for a definite pressure throughout the operating range.

These highly important features of a master controller and of individual regulators may mean the difference between a highly successful installation and a job which needs continual attention and is never quite what you expected it to be. Controls and regulators are available through a very wide price range for the equally wide variations in the requirements of conditions to be controlled. Since so much of the safety, reliability, efficiency and output of a boiler plant depends upon the control system in whose care it is placed, operating engineers, consulting engineers and executives can well afford to make most careful studies of just which controls and regulators have the most of these necessary features. As in most other equipment and merchandise, the lowest priced is not always the best investment.

Instruments will spotlight "what goes on here" and show how boiler output can be increased by stopping wastes of steam, improving efficiency of fuel burning and insuring the reliability of all equipment. Controls will automatically and accurately hold pressures, levels, flows and combustion conditions to maintain that maximum of reliability and output. Instruments and control will increase boiler output in your plant.



Shipping and Container FORUM

By R. W. Lahey

NEW COMMERCE DEPARTMENT REGULATIONS FOR SHIPMENT OF DANGEROUS ARTICLES—MODIFIED I.C.C. REGULATIONS—STEVENS STEEL DRUM CATALOG—NEW "POR-PAIL"—CARBOY TRUCK—STEEL BARREL FIGURES—TIN CONSERVATION

THE Department of Commerce has promulgated new and modernized regulations governing the handling, packing, storage and stowing of explosive and other dangerous articles on board vessels, foreign as well as domestic.

These regulations, according to an announcement by the Department, are the result of four years of work by the Bureau of Marine Inspection and Navigation in cooperation with the Interstate Commerce Commission, other Federal agencies, port authorities, manufacturers and shippers of such articles, vessel owners and operators and other interested groups, including the railroads and motor carriers.

Public hearings were held in Washington last December and the new regulations, embodying certain further changes in the proposed regulations growing out of the hearing, were promulgated early in January, to become effective April 9.

Some confusion had existed in this field of regulation owing to the fact that the Interstate Commerce Commission for many years past has had jurisdiction over certain classes of vessels and the Commission's regulations were not on all points four-square with those of the Department of Commerce. This duplication and confusion has been eliminated in the revised regulations. Officials of the Bureau of Marine Inspection and Navigation point out that the work of representatives of the Commission assigned to cooperate in the revision of the regulations was of inestimable value.

Among other things, the new regulations provide that, for reasons of simplicity and uniformity, definitions of dangerous substances, descriptions, packing, marking, labeling, etc., shall be in accordance with Interstate Commerce Commission requirements insofar as they apply to shipment by common carrier by water.

The regulations will be enforced primarily by the Bureau of Marine Inspection and Navigation and the United States Coast Guard.

Copies of the new regulations in book form are now available at the Office of the Superintendent of Documents, U. S. Government Printing Office, at $1.00 per copy, to cover cost of printing.

I.C.C. Changes Regulations

I. C. C. last month issued changes and modifications in regulations for the transportation of dangerous articles.

The proposed modifications in the Regulations listed in the March issue have been approved with a few minor additions. These changes may be utilized immediately although they do not become mandatory until July first next.

Stevens Distributes Steel Drum Catalog

Stevens Metal Products Co. has recently distributed a catalog on the many types of steel drums which it manufactures. This catalog includes illustrations of straight side drums and bilge barrels made of mild steel as well as those made from stainless steel, Pluramelt, nickel and monel metal. These are shown in both solid head and full open head types in gauges ranging from No. 12 to No. 20.

Testing Shipping Containers for Resistance to Transmission of Water Vapor

The reader's attention is directed to Dr. Warren E. Emley's lecture delivered before the Packaging Conference of the American Management Association on April 2nd in Chicago which is printed in condensed form on the preceding pages of this issue of Chemical Industries. In the June 1940 issue we commented on the need for a solution of this problem and it is encouraging to know that at last something is going to be done about it.

Cross sections of both the all welded and double seamed chime construction are well illustrated as are all of the standard types of mechanically inserted flanges.

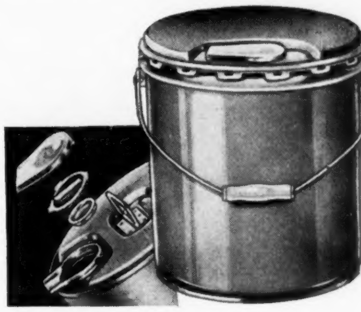
Drums equipped with agitators for both returnable and non-returnable service are shown.

There is a tabulation for each type of drum, which shows the capacity, gauge, inside and outside dimensions, and weight. There are attractive illustrations showing the decorative possibilities.

The company is to be congratulated, as it is apparent that the primary purpose of this catalog is to provide drum users with a maximum of information and company advertising has been relegated to a secondary role.

Wilson & Bennett "Por-Pail"

The R-Type "Por-Pail" is available in 5 and 10-gallon sizes and is suitable for use with paints, oils, syrups, chemicals, foodstuffs or practically any type liquid. The manufacturer claims that it has exceptional strength and is very efficient. In addition to the usual interlocking of the top and bottom chimes for stacking, the top and bottom heads are crowned, respectively, in convex and concave shape,



so the containers will nest one on top of another. This means that the containers can be safely tiered, and, similarly, can be handled in stacks of two or three.

In the 5-gallon size the R-Type "Por-Pail" is available with either separate lug-type cover or with integral, seamed-on cover. The former has the familiar wooden baling type handle, while the closed container has a handle that folds into a small recess in the cover. The 10-gallon size is available only in the drum-type or seamed-on-cover.

Three different pouring spouts can be had on the R-Type "Por-Pail." The standard closure has outer dust cap, twist cap, inner seal, and a swivel spout that swings out of the way so containers can be stacked. This opening is exceptionally wide and will completely drain the container. The other two openings available are a narrower threaded type with inner

(*Continued on page 648*)

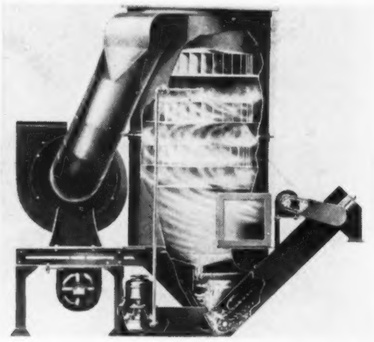
NEW EQUIPMENT

Dust and Fume Collector QC 115

The Claude B. Schneible Company recently announced a new line of Unit Dust Collectors in 2,000 to 10,000 cubic feet per minute capacities.

These new models, designated Type "UC," consist of a fan; five spray curtain tower; pump; settling chamber and sludge ejector-conveyor.

The collector tower is of conventional Multi-Wash design employing water in a cyclonic wash action to absorb dust and fumes on impingement plates and vanes.



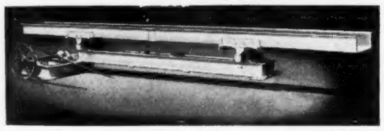
It is claimed that heavy particles are precipitated in the lower inlet cone of the collector, fines being collected and washed back into the sludge chamber by the downward moving water spray curtain. The collector proper has no moving parts so has nothing to wear, clog, burn or break.

The sludge ejector-conveyor operating at slow speed removes sludge from the precipitation chamber, de-waters it in the conveyor boot and discharges it into any convenient receptacle.

Free-flow Conveyors and Feeders QC 116

A new vibrating conveyor and feeder known as the "Free-Flow" has recently been introduced to industry by the Standard Transmission Equipment Company. The new machine operates on the lift-throw principle with the motion of the trough becoming increasingly horizontal with the progress of each cycle, thus imparting to the conveyed material a gentle, forward motion. This motion is so designed as actually to suspend the mass in the air with only momentary contact with the trough on the upward period.

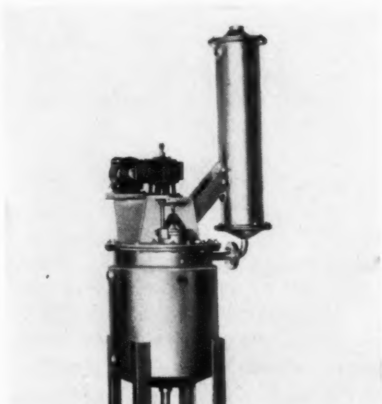
The "Free-Flow" trough is self-cleaning, without the use of chains, flights, etc. Because of this, different materials can be alternately conveyed, or perishables handled without fear of residual contamination. The oscillating arms which actuate the trough are mounted in rubber bushings, which store the forward and return forces, thereby reducing power



consumption. Self aligning, precision ball bearings are used throughout. The trough can be of any desired material, open or enclosed for the handling of hot gaseous or dusty materials. By means of variable speed control of the rate of oscillation of the trough, volume can be controlled as desired, and the material can be conveyed up inclines to 15 degrees.

Mixing and Solvent Recovery Equipment QC 117

The combination stainless steel mixer and condenser illustrated here was de-



signed and built by L. O. Koven & Brother, Inc., to insure speedy and thorough dispersion of a mixture of colors in a volatile medium. Since the blending operation required heat for completion, the recovery of the valuable volatile portion of the vehicle was imperative.

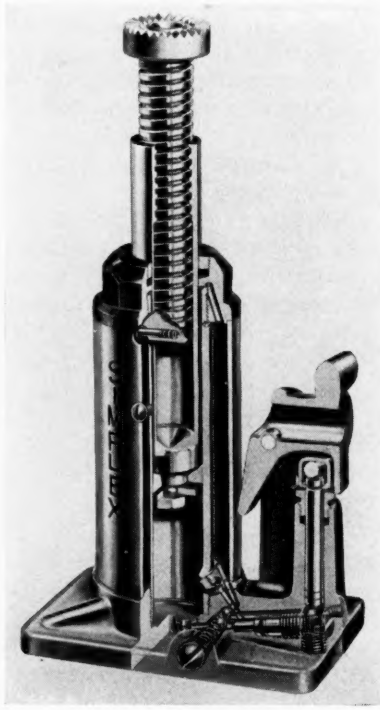
The stainless steel mixing kettle is steam jacketed and is built for vacuum operation. On the motor driven stainless steel agitator shaft is mounted a bottom and side scraping paddle shaped to avoid causing the material to pack. Another mixing paddle on the same shaft set above the scraper at a 45° angle to the vertical, tends to create a down surge in the mix.

Since the mixture tends to become quite thick at the end of the blending process, a unique type of discharge valve is used. The bottom of the agitator shaft is supported on a tripod so located that there is ample opening below it to allow the fluid to drain out freely through the quick opening flush type plug valve, thus assuring not only speedy discharge but accessibility for quick cleaning.

The volatile vehicle emitted from the heated mix passes into the condenser attached to the mixer.

Hydraulic Jack QC 118

As an addition to their broad line of Simplex Lever and Screw Jacks, Temple-



ton, Kenly & Co., Chicago, recently announced a line of Heavy Duty Hydraulic Jacks. Made in 3, 5, 8, 12 and 20-ton capacity sizes, the manufacturer claims many design and construction advantages including neoprene oil resistant seals, pressure-tested malleable iron top nut and base, a machine ground ram, a fully lapped sleeve, ball type valves, needle type load release, center ram for proper balance and a convenient carrying handle. Operating features common to all models include lower closed height, higher raised height, lighter weight, leak-proof design and provision for operation in either a vertical or horizontal position.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 115 **QC 117**

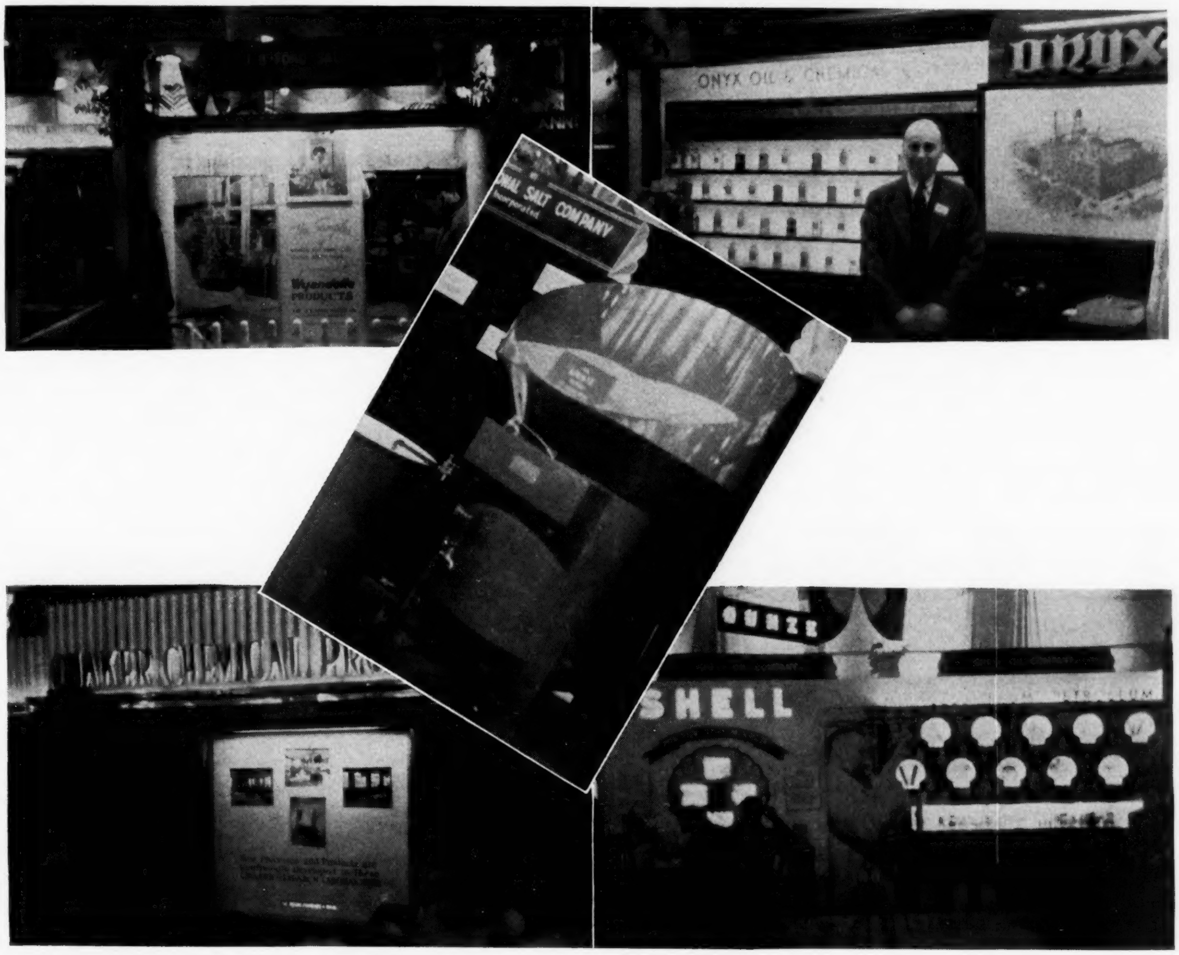
QC 116 **QC 118**

Name ....

Title .... **Company** ....

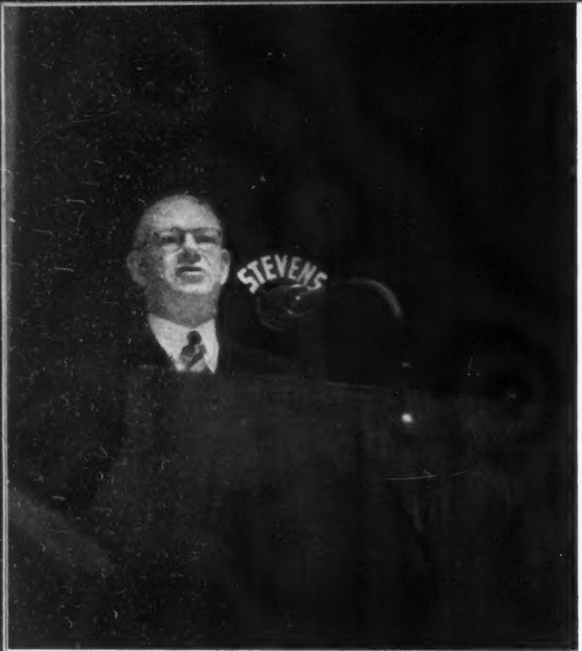
Address ....

CHEMICAL SPECIALTIES



Attractive booths of chemical companies at the 37th Annual Knitting Arts Exhibition at the Commercial Museum in Philadelphia, week of April 21-24. At the top, J. B. Ford Sales Co., and Onyx Oil & Chemical with Leon P. Brick in attendance. Bottom, left to right, Quaker Chemical Products, and Shell Oil. In the center, exhibit main section of International Salt Company's exhibit.

INDUSTRIAL · HOUSEHOLD · AGRICULTURAL



PACKAGING TRENDS and the Defense Program

Staff Report of the 11th Packaging Exposition

Alvin E. Dodd, President of the American Management Association, opening the Packaging Exposition at Hotel Stevens, Chicago, Ill. (Left.)

How seriously will the orderly processes of packaging development be interrupted by the national defense emergency and how readily can packaging adapt itself to the new conditions? Chemical Industries month after month brings you all that is new and NEWS in bulk and consumer packaging of chemicals and chemical specialties. It sent one of its best reporters to Chicago last month to cover the 1941 AMA Packaging Conference and Exposition. Don't take chances—don't be an "Ostrich"— acquaint yourself on what problems you are facing. Do not fail to read about the new threat contained in the proposed federal legislation to standardize package goods. You may be told the quantities you may offer for sale—yes you may be told what size and type of packages you may offer for sale.

PACKAGING experts gathered from the four corners of the United States in Chicago last month in a specially curious mood hoping to find the answer to the question "How seriously will the orderly processes of packaging development be interrupted by the emergency and how readily can packaging adapt itself to the new conditions?"

That such orderly processes of packaging development would be very definitely affected was a foregone and an accepted conclusion by both the makers and users of packaging materials.

Alvin E. Dodd, President of the American Management Association, sponsor of the Eleventh Packaging Exposition and Conference, keynoted the meeting in his opening address in the following terse words:

"The dominance of armament in American production and the adaptation of machines for its manufacture, the placing of priority restrictions on strategic materials, the closing down of foreign sources of supply, the current threat of rising commodity prices—all these are affecting packaging in 1941. And added together they mean that in 1941 we cannot have packaging 'as usual.' Packaging must now adjust its methods, just as must many other industries, to the exigencies of the times.

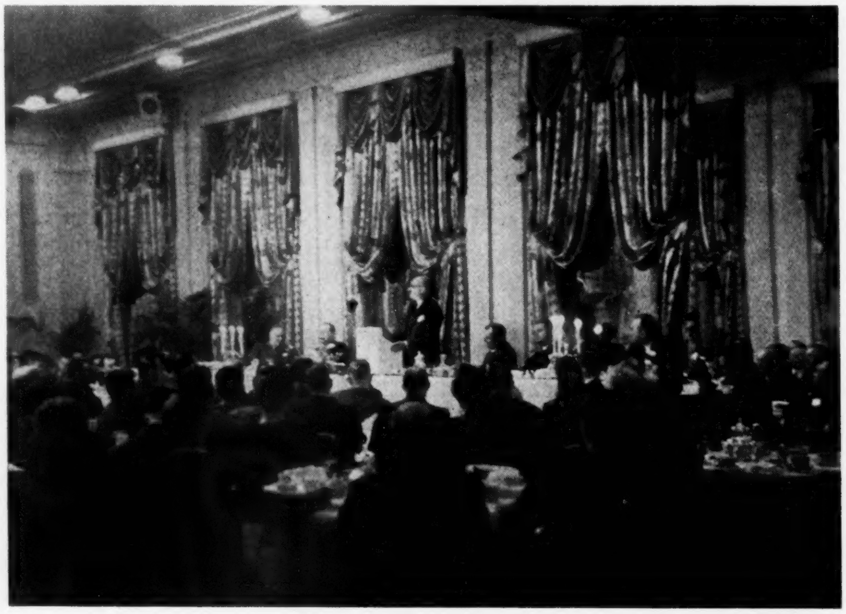
"The 1941 AMA Packaging Conference and Exposition has been conceived and arranged in the light of these considerations."

Seeking first hand information as to what happens to packaging in war times officials of the AMA presented as the luncheon guest speaker I. M. Sieff, Vice-Chairman of Marks & Spencer, Ltd., London. To a large and particularly attentive audience Mr. Sieff visualized what British businessmen were facing with "thumbs up." Said this distinguished foreign merchant in part:

"In Great Britain all planning ahead has to be regarded in the light of the declared Government policy to limit consumption of civilian goods. The Government has not deviated from this policy in spite of the hardship and sacrifices suffered by hundreds of manufacturers and retailers. Added to these difficulties are such inconveniences as blackouts, the need to hurry to air raid shelters as the evenings draw in, the early closing hours, the actual reduction in shopping hours. Wage earners who have been accustomed to make their purchases on their way home from the factory or office now pass the shops quickly without entering, in order to avoid the danger which menaces them from the air. A great part of this business is permanently lost.

"It is interesting to note that although the demand for consumer goods is very much in excess of supply, there has been no serious inherent inflation. Prices have advanced but the reasons are mainly government controlled price of raw materials and the purchase tax; the Excess Profits tax, which is now 100% of the profits in excess of the standard year, on the other

I. M. Sieff, Vice-Chairman, Marks & Spencer, Ltd., London, England, discusses how warring countries have met their packaging problems at the luncheon meeting on April 2. Sieff visualized British business policy.



hand, has made many traders resist the temptation to profiteer and the Price of Goods Act, with its penal clauses limiting the gross cash profit per unit of article, has been an effective deterrent.

"The British have adapted themselves ingenuously to scarcities and restrictions. One of the problems growing out of these restrictions concerns packaging, since there are shortages in glass, metal, wood and paper, particularly the latter—not only because imports are cut off from the Scandinavian countries, but because of the importance of conserving cargo capacities for war imports. The Government has issued strict orders concerning paper control, as for example that no advertising matter is to be placed inside wrappings, cartons, or containers, and no article retailed may be wrapped or packed with paper unless absolutely necessary for protection.

"Carton production is rigidly controlled by an order issued in May, last. Stock on hand at that time could be converted, but if material was not in stock, a license was to be obtained from the Ministry of Supply for this conversion. A license is necessary, too, before any paper or board can be imported. A campaign for eliminating the carton altogether is being launched by business leaders. A manufacturer has announced, 'The carton trade has reversed its engines—instead of pointing out the advantages of cartons over other forms of packing we are now telling customers that cartons are largely unnecessary. Our hope is that if these good deeds are unnoticed on earth, they may be recorded in heaven.'

"The Biscuit Manufacturers Defense Committee pays prices ranging up to one shilling for returned containers. Labels on packaged goods are limited to an area not to exceed twenty square inches. This has meant the redesigning of labels in the long narrow type which run around the can with vertical dimensions of two inches or less.

"Tinplate containers are prohibited for many commodities such as for cat, dog, bird foods; cosmetics; biscuits; sweets; and for display purposes. Coffee may be retailed only in returnable four pound tins. This order does not, however, affect packaging for export.

"The British Government has taken over the entire output of aluminum, and further import has been banned. This requires the finding of substitutes by firms using collapsible tubes and aluminum closures, such as those used for milk bottles. Aluminum foil as inner wrappings in cigarette packages is now eliminated. The pottery trades producing domestic materials are working full time, making pottery jars on which metal closures are used and decalcomania transfers are used widely for decorative

Packaging in the Defense Period

The symposium "How does the Defense Program Affect Packaging" held on Tuesday afternoon, April 1, attracted a tremendous audience. Experts in the respective fields of paper, metals, plastics, transparent sheeting, packaging machinery, shipping containers, and glass contributed much sober thought to the discussion.

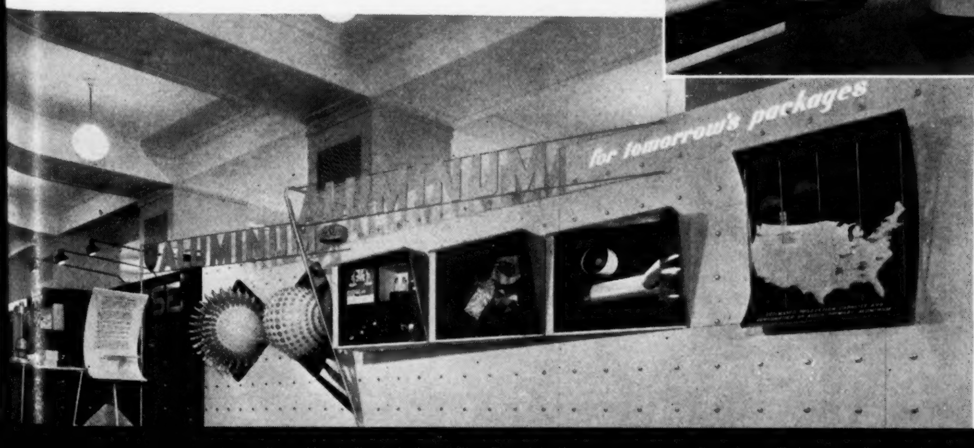
That there will be some delays, certain shortages of both materials and equipment was, of course, admitted, yet it was strongly stressed that the "rumor-mongers" have been working overtime. In our peace-time economy there is natural competition between different kinds of packages, and the more efficient containers for particular goods are utilized. The importance of maintaining this balance as nearly as possible under defense or war conditions was duly stressed. On the other hand several of the speakers insisted that the "rumor allayers" were equally out of place at this time. Manufacturers who adopt the policy of constantly keeping in touch with changing conditions will find substitutes available. Plastics and glass offer many new opportunities. Certain shortages of metals may only be temporary. The present situation calls for ingenuity of the highest type.

Sears' Informative Labeling

Informative labeling—always an interesting live subject to packaging experts—was given a new angle at the opening

For five days, April 1-4, from 1:00 P. M. until 10:00 P. M., except Friday, those interested in the many-sided questions to the packaging problems of industry thronged the Exposition Hall of the Stevens Hotel.

Packaging and labeling machinery containers of all types and sizes were on display. The colorful 11th Conference and Exposition attracted a record attendance from all over.



Despite priorities several of the metal companies presented most attractive displays. One of the most popular was that of the Aluminum Co. of America which is shown here.

Personalities at the Exposition:— From left to right, M. Gaukerud, Sales Promotion Department, Container Corporation of America; P. C. Meelfeld, Hinde & Dauch; Stephen Pearse and J. J. Callahan, Cleveland Container.

session of the conference by Fred C. Hecht who discussed the experiences of Sears, Roebuck and Co. as an illuminating case history.

"Our program," stated the speaker, "was originally started because of the so-called consumer movement—then a minority perhaps, which through agitation, publicity and demands of one sort or another, was making the average customer more acutely conscious of all the facts she should have in order to make an intelligent selection of her own free choice, in keeping with her needs and pocketbook. Sears sympathized with this movement and we felt it good business to tell our customers specifically and accurately, by means of the informative label, what they were buying.

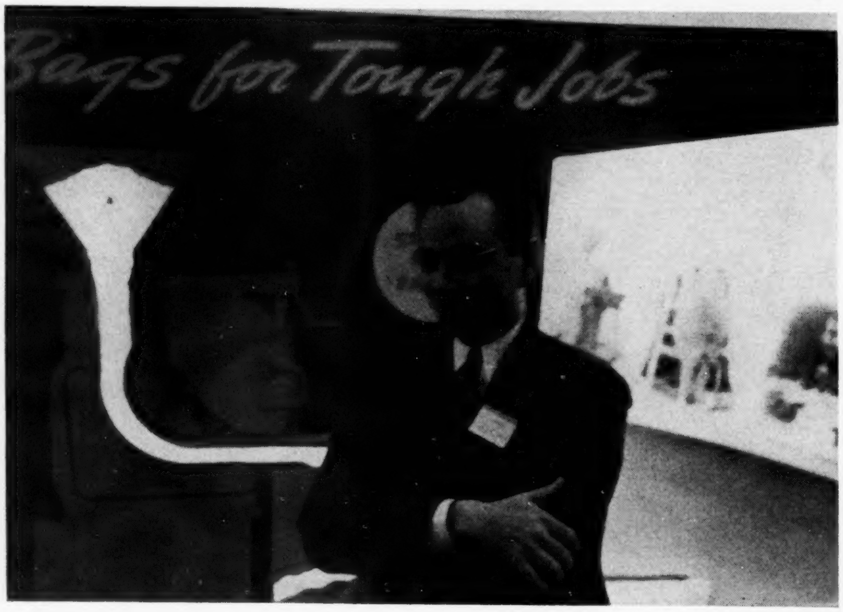
"We ourselves have since discovered many benefits, merchandising benefits, from these labels which are, in our opinion, of far more immediate importance than the eventual betterment of consumer relations. Besides the bringing about of better selling which we shall cover in detail later, *INFOTAGS* in our Company have been responsible for better buying. For example, in trying to give informative copy which shows the difference between 15¢, 19¢, and 25¢ items within a given line, it sometimes reveals that there is no real need for all three items in the assortment. Many lines are being reduced in this manner, making for a better merchandising structure, greater concentration on less numbers, more specification buying with its consequent savings in cost to Sears, Roebuck and Co. and their customers. This is, in our opinion, a very real contribution.

"Last, but not least, the aid *INFOTAGS* can be in our stores in providing uninformed and sometimes insufficiently trained salespeople with pertinent facts at the point of a sale is the most important reason for the program. The *INFOTAG* is also a definite help in our stores in holding or clinching a sale when there is no salesperson in sight or immediately available. It acts as a silent Sears salesman, attached to the merchandise, briefly eloquent, refusing to take "No, just looking, thank you" for an answer.

"The Informative Label and Package Development Department at Sears is a division of the General Merchandising Office—not advertising—not display—not public relations—but merchandising. The reasons that Informative Labeling is a merchandising function at Sears are (1) because the merchandising departments are most benefited by it, and (2) because the interest in the movement at our Company was originated by our Executive Vice-President, Mr. D. M. Nelson, now on loan to the Government who at that time was Vice-President in charge of merchandising, and whose whole-hearted support and that of his successor, Mr. T. V. Houser, has made the labeling program a comparatively easy assignment.

1. *Trade Names*

"It is perhaps needless for us to mention the importance of Sears own brand name and our own brand merchandising policy. Some of these trade names are more nationally known than nationally advertised merchandise. They are, we feel, the blue ribbon names in retailing. Trade names, always emphasized on informative labels, make retail selling more effective, impressing on the customer the name by which the merchandise is known.



R. H. Procter of St. Regis Paper snapped in front of the very attractive company booth, which displayed "Bags for Tough Jobs."

Above, W. L. Stensgaard, President, W. L. Stensgaard & Associates, Inc., Chicago, who discussed "Display as a Factor in Package Merchandising." Center, Oliver E. Benz, formerly of DuPont, now, Vice-President, Packaging Division, American Management Association. Right, Alex Pisciotta, Director, New York's Bureau of Weights and Measures, whose controversial paper, "The Standardization of Packaged Goods" aroused considerable discussion.

Only at Sears, obviously, can Sears trade named articles be purchased. A recent market survey, made for us by an outside organization, uncovered the facts that in some cases examined, the trade name was responsible for over 50% of the purchasing at Sears.

2. *Selling Copy*

"Mr. and Mrs. Consumer want to know about the merchandise before they buy. Features listed on the *INFOTAG* immediately give them an accurate description . . . even before a salesperson is available. Salespeople refer to the features on the *INFOTAG* for facts that clinch sales.

"Answers to the questions, 'What is it?' 'What will it do?' are expressed in outline form with the emphasis on 'sell.' These are the answers which interest the customer most and which provide the salesperson with ideas on which he may elaborate—a handy outline chart for the salesperson to use in putting across the few final punches in closing the sale. We try to avoid 'dry as dust' copy. We do not ignore what advertising men refer to as 'emotion in promotion.' Frankly, we try very hard to take advantage of the very important emotional appeal.

3. *Related Items*

"Additional merchandise can be sold by suggesting related items on the informative label. This tends to build up trade name acceptance and added sales can be traced to these suggestions. This cross reference of related items is a 'natural' that is sometimes overlooked, but usually with adequate planning, space can be made available for such 'plugs.'

4. *Technical Specifications*

"*INFOTAGS* list the hidden features not apparent through sight or 'feel,' giving construction and materials used, backed by Sears Laboratory tests and conforming to The Federal Trade Commission and other governmental rulings . . . an authentic description that the consumer has learned to trust. Needless to say, the claims made on the label must be true . . . every fact stated on the *INFOTAG* is checked and proved by exhaustive laboratory tests. Sears Testing Laboratory is one of the largest of its kind. The *INFOTAG* tells the consumer about the specific uses of the item . . . how it may be used for one purpose, but not for another, preventing over-selling and consequent dissatisfaction. Hard-to-remember mechanical specifications are always before the salesperson for quick reference.

5. *Care and Handling Instructions*

"After the sale is made, on many items instructions are needed to insure maximum life and more satisfactory use of the merchandise. When an *INFOTAG* is attached, with adequate information supplied, returns are cut down. The return goods evil, long a nightmare to all retailers, is caused in a great measure, it is generally conceded, by improper care, handling, and use on the part of uninformed customers. Salespeople in a large majority of instances are unable to answer customer inquiries about washing instructions or technical handling which make for longer life and more satisfactory use. We do not claim that Informative Labels will put an end to returned merchandise, but we believe they will eliminate, to a large degree, returns caused by misuse or improper care with consequent customer dissatisfaction and will alleviate the adjustment managers' problems.

6. *The Guarantee*

"The established integrity of Sears and the mail order policy of 'Guaranteed Satisfaction' are widely recognized . . . but a guarantee on the *INFOTAG* gives an added punch to the sales appeal. Many

The AMA Shipping Container Clinic discusses the new Merck machine blown carboy with new pouring lip.

Owens-Illinois displayed a wide variety of containers, many of them packages for marketing household and industrial chemical specialties. Notice the eye-appeal of both the booth and its products.

a sale is completed by the reassurance of a Sears guarantee on the goods.

7. *Trade-Up*

"The copy on the *INFOTAGS* for a line of similar items at different prices shows the step-up in quality as price increases. This information makes it possible for the consumer to make a free choice. It's practically 'cafeteria' selling! By examining the labels the consumer can readily see why one item is $1, $2, or $3 more than another similar item . . . quality differences are clearly pointed out on the *INFOTAGS*. Added features for more money tend to increase unit sales . . . the consumer often buys a better and higher priced item than first considered. This trade-up policy helps Sears buyers choose items that have real differences as price increases. Sometimes there have been too many items too similar in quality in a line. Through making up new *INFOTAGS* this was brought to light . . . the buyers cut down the assortment, resulting in much better merchandising.

8 *Color and Design*

" 'Art' is incorporated in *INFOTAGS* only to the extent that it will help do a better merchandising job. The Consumer Public has definite color preferences for each type of merchandise . . . there is a 'natural' for every job. These are considered in establishing color schemes. Design is used to make a pleasing arrangement of the parts included on the *INFOTAG*.

"Our policy is to use just one tag, one label, or one folder as the *INFOTAG*. The complete merchandise story is told on one compact piece, avoiding the cluttered look that exists when there are many unrelated tags, labels, and folders attached to each item. As many of the '8 points' as are applicable to the specific item are covered in the copy on the single *INFOTAG*."

The Consumer's Point of View

The point of view of the consumer was discussed most satisfactorily by Mrs. Wilbur E. Fribley, President of the Chicago Housewives' League. To the hundreds of packaging executives assembled in Chicago seeking new ideas, fresh packaging points of view Mrs. Fribley significantly pointed out that today consumers expect definite service as well as protection through packaging done by the manufacturer or the processor. According to this authority the average purchaser wants:

1. Coverings for useful purposes, not for deception.
2. Coverings that make easy all possible knowledge about the product. Even small cellophane bags show size and condition of beans or rice.
3. Coverings that bring products into the home in the best possible condition, with the least change from the peak of perfection, whether those products are food, textiles or equipment.
4. Coverings that assure the purchaser of original content, no substituting or camouflaging.
5. Labels which are easy to read, giving content, weight, name of manufacturer or processor, thus facilitating future choices.

"Much discussion goes on concerning so-called closures," reported this representative of consumers. "Many of them are difficult, messy and wasteful, if not downright dangerous. These faults can apply to almost every type of closure. Only the integrity of the manufacturer or the processor protects the consumer. Perhaps one of the greatest research problems for the packaging industry today is this one of workable closures.

"From a consumer point of view, the future of packaging depends on decidedly improved retailing methods; on comparative displays rather than exclusive showings; on the obvious honesty of the container; or better and more easily read labels; on the willingness of industry to help educate rather than hypnotize the average consumer; on the integrity of the manufacturer or processor. When all is said and done, one truth sums up the entire situation—and complete satisfaction to the manufacturer, retailer and consumer can only be attained through not only its recognition but universal acceptance. The true point of sale is at the point of use not at the point of purchase."

Display as a Factor

Several very novel ideas were presented on the absorbing subject of display as a factor in package merchandising by W. L. Stensgaard, President of the well-known firm of packaging and merchandising counselors—W. L. Stensgaard & Associates, Inc. The speaker presented an imposing array of products to illustrate his statements. Mr. Stensgaard said in part:

"In trying to analyze such a complex problem as package and package design which becomes more complex as we think in terms of assortments or departments or displays of unrelated and competing merchandise within the store or 'point of sale,' we need, I believe, to arrive at a simple denominator. This simple denominator is best expressed in the term 'Visual Rightness.'

"Usually this 'Visual Rightness' has a definite relationship to 'Functional Rightness' and thus brings about not only better appearance but greater efficiency and usually at no increased cost of production except that which is easily amortized or absorbed by reason of increased results but more important, such usually forestalls the decline that inevitably takes place when we avoid essential change. We may have an ever so good looking single package but when it is combined with other packages, it may not be nearly so effective. In other words, we may have a good looking necktie but we could wear it with the wrong suit or shirt, thereby spoiling all three. We might have a good looking chair but put it in the room with

the wrong arrangement, setting and colors and everything would be affected.

"In any assignment having to do with product change or proper setup for efficient 'Merchandise Presentation' we believe the following studies are essential:

A. Review past experience of the product and package in question. This includes history, volume and profit factors, sales and distribution.

B. Obtain information on competitive best sellers.

C. Reasons for competitive successes or failures.

D. Investigation of competitive selling prices and markup.

E. Purchase by shopping at retail, competitive packages to obtain facts about sales advantages.

F. Study of locations in which products are sold and establish results as to square foot sales, turnover and ability to obtain better locations through possible revisions of package and plan.

G. What advantages to isolated displays as compared showings with competitive products.

H. What reduced or increased costs can be absorbed by increased volume profitably.

"Altogether too much space is given (and for that matter perhaps too much time also) to the showing and selling of products that do not bring a satisfactory return for the space they occupy. Smaller retailers hurt their volume and their profit by not being more familiar with this kind of 'Retail Arithmetic.' For that reason many manufacturers have found it practical to offer assortments or deals. This means a reasonable assortment of merchandise with a display set-up that will properly guarantee the showing of the merchandise on the counter, on the floor, in the department or in the window. This is usually designed to show a proper balanced inventory which will help to make for a repeat turnover and sometimes these units are designed to help control inventory. Such control is very important because in thousands of places little regard is given to the best selling item or colors or size because when looking at the counter the clerk or retailer says 'Yes, we have that line.' The difficulty is that he has pints, not quarts, thinking that when the dealer wants a quart, he will give him two pints at the quart price, thereby reducing his mark-up or profit.

"Also he loses a large number of sales because he does not have the right size or the best sellers. Therefore, again, display is not only helpful to the distribution of goods but it is very helpful to the resale of the merchandise.

"New materials such as clear plastics as well as other types of plastics will help to revolutionize much of 'point-of-sale merchandising.' Again I mention the human mind thinks in terms of pictures, not words. This is another safeguard for the manufacturer that his product will be properly visualized and respected at the point of sale. It is regrettable that too much 'switching' takes place at the point of sale.

"I consider display the greatest policeman to guard against switching at the point of sale. Display not only helps the retailer to buy balanced inventory but most of all, it helps him to sell in relationship to 'best sellers.' Chain stores have found display indispensable insofar as department and counter and sectional layouts are concerned by which inventory control in relationship to best sellers and volume are automatically handled. All of this properly arranged not only makes for 'Visual Rightness' but you can quickly appreciate it makes for 'Factual Rightness' as well."

Standardization of Packaged Goods

Most controversial subject on the highly informative Chicago program last month in Chicago was the paper on "The Standardization of Packaged Goods," delivered by Alex Pisciotta, Director of the Bureau of Weights and Measures of the City of New York. While the proposed Federal legislation seeking to eliminate odd-weight and odd-size packages is designed to cover foods manufacturers of all types of consumer goods saw in it a threat against certain packaging practices and the subject is of grave concern to manufacturers of chemical specialties. In his formal presentation of the subject the speaker stated:

"In June 1938, I addressed the National Conference on Weights & Measures in Washington and posed the problem of taking national legislative action. It had become quite clear, from our study of standardization that the problem transcended state lines and needed some sort of Federal supervision or regulation. It was also clear that standardization of dry food products in containers was only a small though important cog in the wheel.

"Most food products today are packed in cans, and therefore, standardization in this field became a matter of great importance. At the conference, a special Committee on Standardization of Packaged Goods was appointed of which I was designated as chairman. The committee was directed to prepare legislation to bring about the standardization of packaged commodities which it felt was necessary.

"The first standardization bill refers to the standard packaging of dry staple food products. This means, in effect, that these products whether packed in the customary cardboard or paper package or in glass and metal containers must be of the prescribed standard capacity weights of one-eighth pound, one-fourth pound, one-half pound, three-quarters of a pound, one pound, one and one-half pounds, and multiples of a pound with the exception of candy, which may be sold by numerical count when packed in units of twelve or less.

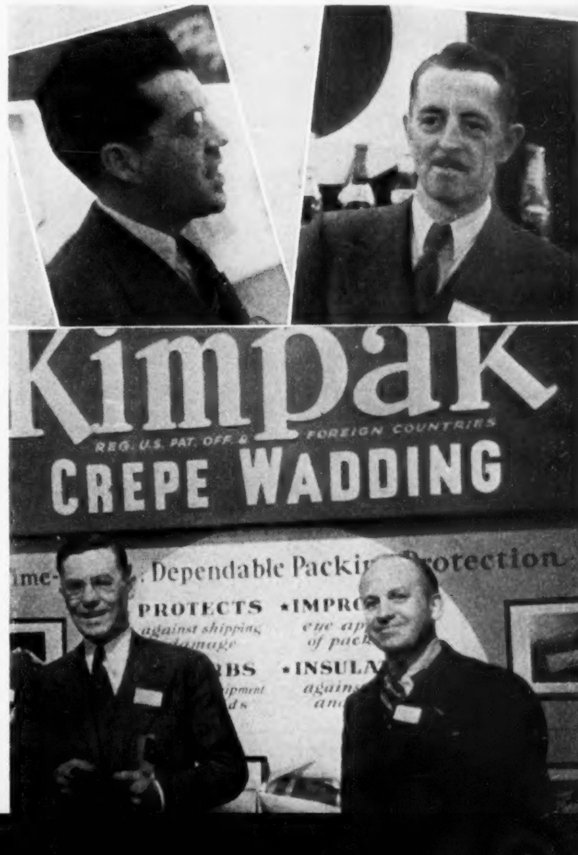
"Since the preparation of this bill several other problems have come up. These matters are subject to further conferences to be held during this month, not only with the representatives of the industries involved but also with the representatives of the Food and Drug Administration who have shown a keen interest in these matters. Inasmuch as this first bill is Federal legislation, it is applicable only to the sale or shipment of these products in interstate commerce. Enforcement is now placed in the Food and Drug Administration. Unlike the other standardization bills to be submitted, no board of standardization is established here to rule on tolerances, but this function is given to the enforcing agency which prescribes the tolerances, net weight, markings, etc., for these products.

"The second bill provides for the standardized packing of edible oils, syrups, honey and molasses. Edible oils and syrups must be sold on the basis of liquid measure, except when the quantity exceeds five gallons. Then it may be sold by net weight.

"The first provision of this bill applies to containers of any description. It states that edible oils, syrups, honey and molasses when sold by liquid measure must be sold in quantities of two ounces, four ounces, one-half pint, one pint, one quart, one-half gallon, and one gallon and multiples of a gallon. We provide that honey and molasses may also be sold by net weight. The standard capacity for these two commodities, however, when sold by net weight, must be one-eighth pound, one-quarter pound, three-quarters of a pound, one pound and multiples of the pound.

"A board of standardization is created under this bill with the power to approve

Below, S. D. Smith, Union Bag & Paper. To his right, R. Wright, Reynolds Metals. Below, S. B. Fithian and F. A. Brederman both of Kimberly-Clark who were kept busy.



such other containers as the industry may require in the future because of the introduction of new processes or other methods of packing, and to permit the use of specialty trade mark containers now in use, such as, the can in the shape of a log cabin or other specialty containers of this type. However, the capacities must be in binary submultiples or multiples of the gallon or pound. The metal rectilinear containers with the dimensions prescribed under this bill are those most commonly used in the packing of these products today. They are the one-half pint, one pint, one quart, one-half gallon and one gallon.

"The third bill concerns itself with the standardization of canned fruits and vegetables and their juices. Under the first provision of our proposed bill, fruit and vegetable juices in containers of any description must be packed only in the following standard fluid capacities: 8 ounces, 12 ounces, 1 pint, 1½ pints, 1 quart, ½ gallon, 3 quarts, 1 gallon and multiples of the gallon. We make an exception of the 6-fluid-ounce container, with the restriction that it be used exclusively for consumption on the premises. We thus eliminate the many off-standard capacities heretofore used. This was done because we are convinced that these sizes are very deceptive.

"It must be clearly understood that the dimensions of the diameters of the metal container are prescribed, and that the Board of Standardization established by this bill has no authority to change these diameters. It does have the power to establish tolerances in the height of the given containers whenever the necessity arises. We are fully aware of the fact that new or different methods of processing may demand a slight change in the height of a container. When these occasions arise the Board will act to meet the situation.

"The latter half of this bill relates to the more complex problem of the standardization of canned fruits and vegetables.

"The proposed bill provides for seven general sizes. One of these sizes is restricted to the packing of fruits and the other to the packing of vegetables. The great number of special sizes now in use is reduced, under this bill, to fourteen cylindrical and two rectilinear sizes. It should be especially noted that only the fruits and vegetables indicated for each special size can be packed therein. We are guided by the idea that eventually the industry will eliminate all special sizes and confine the packing of fruits and vegetables to the seven basic general sizes.

"The creation of a board of standardization under these bills was suggested by representatives of the industry. They felt that the dimensions of metal containers should not be so rigidly fixed as to prevent necessary changes due, for example, to new methods of manufacture, processing, or packing. The Committee felt that a member of the National Conference of Weights & Measures Officials should be on this Board.

"Other provisions of the bill provide for its enforcement by the Food and Drug Administration. With the passage of this legislation by the Congress, the States could pass enabling acts similar to this in content and provide for their enforcement by the State or local weights and measures officials.

"It is the desire of our Committee to submit this legislation to the Congress as soon as possible. A final draft will be submitted as part of my report to the National Conference of Weights & Measures Officials in Washington this June. Between now and then several conferences have been scheduled with members of some of the industries involved. You must realize that this question of standardization is nothing new nor have these bills been prepared haphazardly or with little consideration or thought. It has been the result of many years of study, investigation and diligent effort on the part of those interested in this problem."

Army and Navy Shipments

Chemical specialty manufacturers in common with all producers of consumer goods may shortly find themselves supplying in much larger quantities a wide variety of products to the army and navy because of the greatly increased demand from the greatly expanded United States military establishment. Some specialty makers who formerly shied away from government contracts may find it necessary to assume government contracts. A. W. Luhrs, President of the Container Testing Laboratories, discussed for the benefit of those attending the conference certain of the problems that should be anticipated to avoid costly delays and trouble.

In the Army listing of published specifications there are approximately 6,000 different articles, while in the Navy there are approximately 3,000. These, of course, do not cover all items but are the ones for which there is a printed specification, either Federal, Army or Navy. In some cases the Federal, Army and Navy specifications may be alike or in other cases, certain features of each of the specifications for the same article may be different. With possibly a few exceptions every specification provides for the packing of the article involved. Most of the packing requirements are given in considerable detail while some merely call for commercial packing.

Certain types of containers which are generally suitable for commercial use in this country might be quite unsatisfactory when subjected to the added demands of the armed forces. It is quite possible that some articles will be subjected not only to many reshipments but also to terrific heat in the tropics, intense cold in the Arctic regions or excessive dampness and water both on land and on sea.

The great variety of products and the different conditions to which their containers will be subjected indicate the complexity of the task involved in formulating packing specifications which do not unduly hamper the government supplier and at the same time insure delivery in good condition at the ultimate destination. However, due to the interest of all parties concerned great strides have already been made in improving and amplifying the packing of the defense materials.

Recently the American Management Association sent out a questionnaire asking for specific information regarding packing practices on shipments going to the Army or Navy. To date, replies have been received from 139 companies of whom 87 or 63% have government contracts. Of these 87 companies 33 complain they have some trouble in packing due to the specifications set up by the armed forces.

Upon further examination of the questionnaires it was found that of the 87 companies reporting on defense shipments 30 stated that the weight of the empty container specified by the government exceeds that of the container regularly used, while 36 stated that the cost of the specified container is more than the normal container cost.

The large number of concerns reporting an increased container cost of over 50% is probably due to several factors. Most likely is the fact that government specifications in many instances are more rigid than ordinary commercial specifications because of the added abuse the packing must be able to withstand such as many more and severe handlings and the possibility of storage in the open air.

In response to the question regarding advisability of changing the government packing specifications in which they are particularly interested 30 out of the 87 replied that they thought revisions should be made.

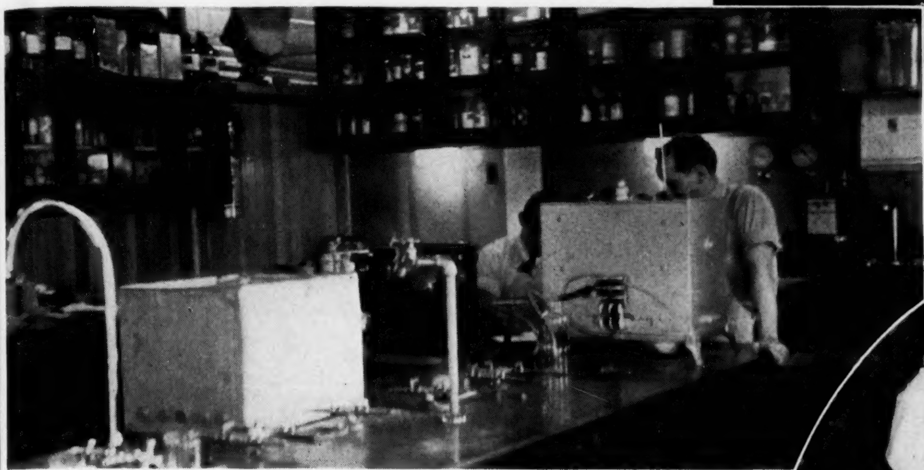
Many of the manufacturers recommended a change in the type of shipping container now specified for their products as, for example, a change from wood to wirebound or fibre.

A soap manufacturer, for example, reported that the government wooden box specifications are usually heavier than they would normally use. For example, for 56 pounds of soap powder, the government requires ⅝" sides, top and bottom and ¾" ends whereas they ordinarily use boxes whose sides, top and bottom are $\frac{5}{16}$" and ends ⅝".

BAGS in the Modern Manner

An inspection tour of the Bemis Bros. Bag Co.'s research laboratories, a plant trip not officially scheduled by the Plant Visits Committee of the St. Louis Section of the American Chemical Society, disclosed to two editors of Chemical Industries last month an insight into the scientific approach to the solution of modern bulk packaging problems in the chemical and closely related industries.

A general view of the Bemis Chemical laboratory at St. Louis. Here special packaging problems are solved in the Bemis "Torture Chamber."

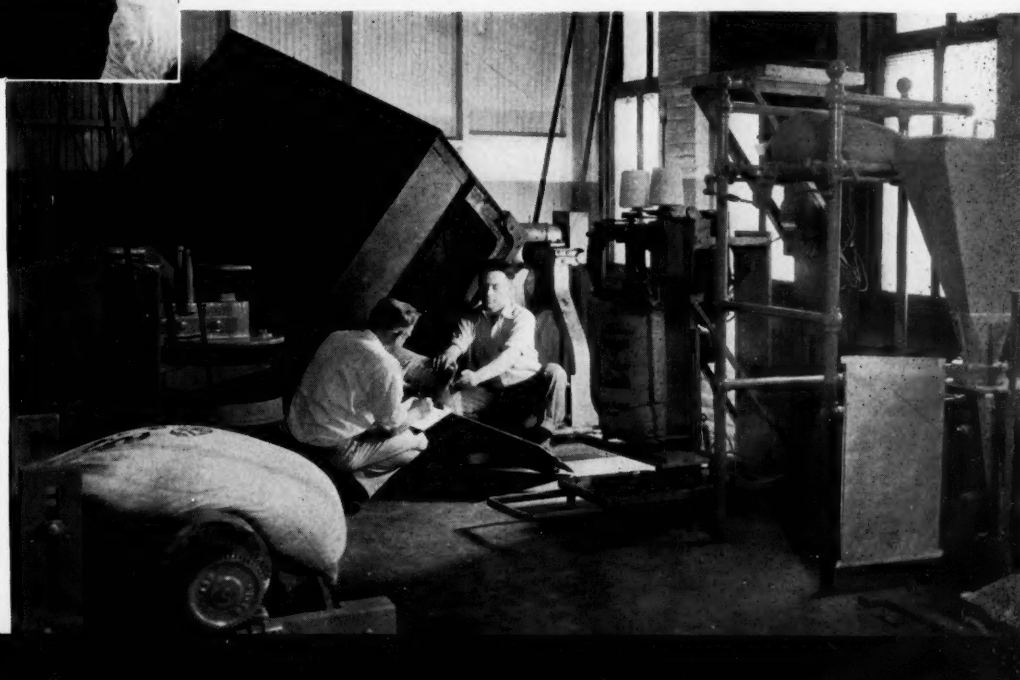


The box at the left is a low temperature cabinet where bags may be tested in any desired degree of coldness to 40 degrees below zero. The oven at the right is used for testing bags which may be subjected to high temperatures. Bags used in northern climates may have to undergo very severe cold. Bags used in tropical countries must be able to withstand intense heat. The construction of the bag is designed to meet the conditions where it is to be used.

Photograph shows the inside of the specially designed humidity box. Bags are hung up ready for testing. In the Bemis laboratories have been solved many problems connected with "hard to pack" chemicals.

Paper testing equipment. The device at the right tests the tearing strength of paper and is being demonstrated by A. M. Keller, chief chemist. The tall cylinder at the left tests the porosity of paper. This is an important quality in bags for certain products. Approximately 2,000 tests of various kinds are made every year under Mr. Keller's direction.

At the right is a view of the bag dropping machine. The machine at the left is used to test bags for stamina against rough usage.



CHEMICAL SPECIALTIES
at the
KNITTING ARTS EXHIBITION

To Philadelphia's Commercial Museum last month journeyed thousands of executives in the textile field to learn what was new in both machinery and chemicals. While not as many companies in the chemical, dyestuffs, and chemical specialties industries were exhibiting as in former years, a number of very prominent companies in the textile chemical specialties field were present. At the left, the very attractive booth of Scholler Bros., Philadelphia.

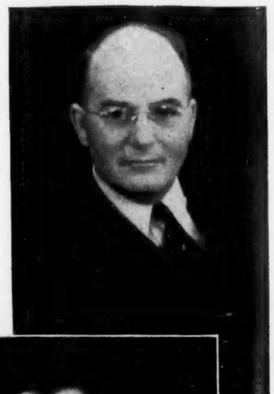
Above, A. Jenny, G. R. Purdy, and R. A. Watson of Onyx Oil & Chemical Company of Jersey City, N. J.

Below, a group of International Nickel representatives — C. J. Bianowicz, E. A. Turner, and E. C. Badeau.

Below, at the left, W. K. Slattery, D. M. Kadel, and A. J. Hulsebosch of International Salt Company.

At the right, H. Higginbotham, Leatex Chemical.

Above, a group of Shell Oil representatives pose for the "Candid" camera. Left to right, R. P. Ritchie, W. S. Boykin, F. C. Rule, L. W. Catling, and C. B. Huntoon. Pictures of several of the attractive booths of exhibitors will be found on the introductory page to this month's Chemical Specialties Section.

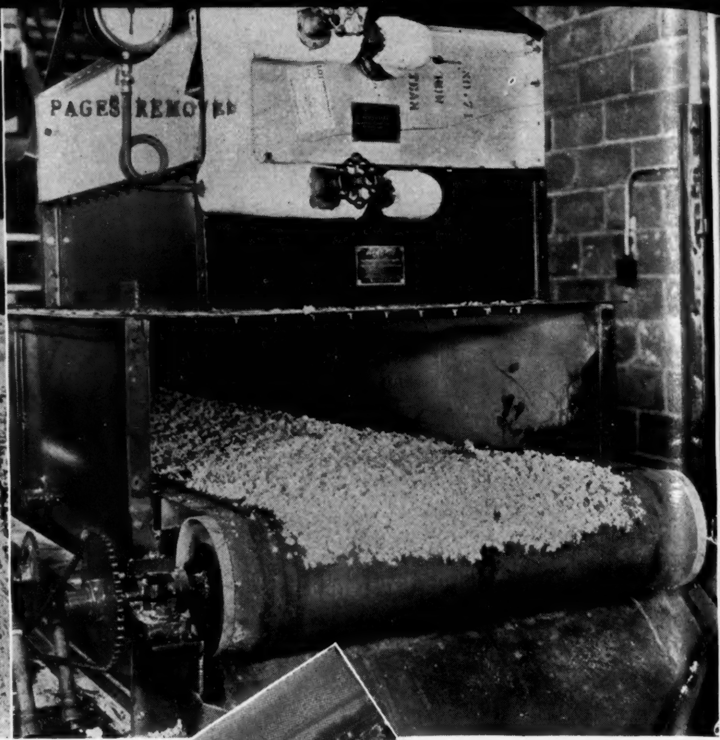


Below, left to right, Francis T. Quinlan and Robert A. Bruce of Amalgamated Chemical.

At the Quaker Chemical Products Booth:—D. Priestley, H. N. Koppel, and E. Niessen, vice-president. At the right, N. Judson Miller, southern representative of the same organization.

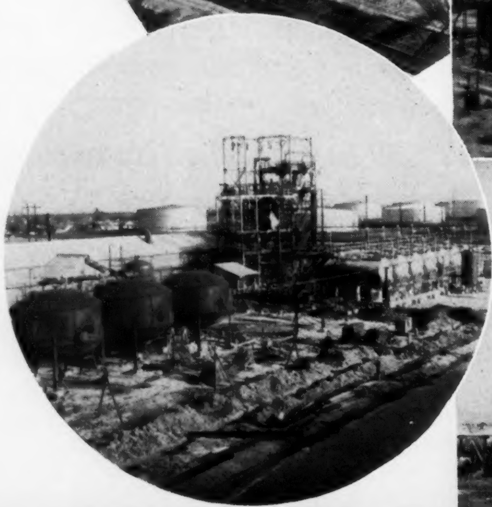
Thiokol Rubber

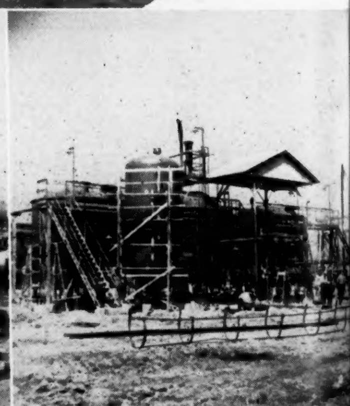
Photos at right show Thiokol synthetic rubber being milled at Thiokol Corp.'s and Dow Chemical's new plant at Midland, Mich. At extreme right, pellets of Thiokol leave a conveyor belt. New plant, it is said, has a capacity of 6,000,000 pounds annually. *Below,* Miss Louise McGrath, vice president of Booth Chemical Co., Elizabeth, N. J., in a paper mill installing chemical feeders for the treatment of water through which the pulp passes.

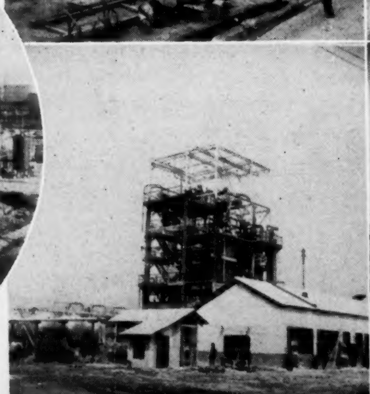


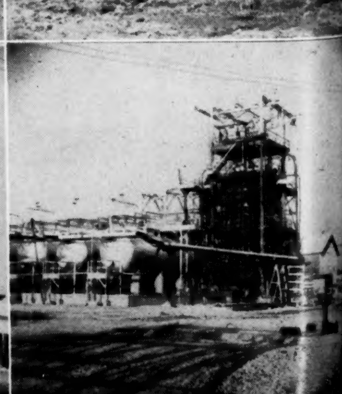
Buna Rubber

At the right (*large photo above*) Standard Oil's buna rubber plant at Baton Rouge, La., now in production. In circle, a general view looking southeast. Other photographs in corner show brine facilities (top right), drums and fractionating structure (bottom right) and other general views of the plant.





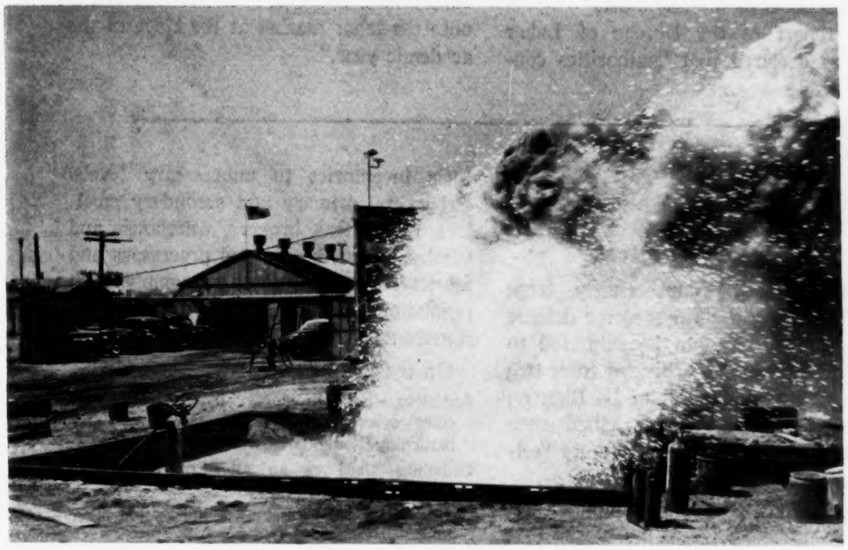




NEWS OF THE MONTH

Dr. Gustav Egloff (second from right), is shown here on the occasion of his visit with the Colombian Chemical Society during his recent goodwill tour of South America. Sent by the government and the National Research Council, Dr. Egloff was elected as the first honorary member of the Colombian Chemical Society, an expression of appreciation toward the American Chemical Society. At his right is Dr. Jorge Ancizar-Sordo, vice-president of the Colombian Society.

Dow, cooperating with Pyrene, recently announced a newly-perfected powder known as G-1, the only effective extinguisher in tests on incendiary bombs. A shovelful of the black powder put on an incendiary at the Associated Factory Mutual Test Station, Everett, Mass., stopped the fire so quickly that it was possible to salvage the magnesium in the bomb. Powder is now on the market for use in manufacturing plants handling magnesium. This photo shows what happened when carbon tetrachloride fire extinguishers were used to extinguish incendiaries.



News Index

IN REVIEW

CHEMICAL INDUSTRIES

DEFER STUDENTS, LOCAL DRAFT BOARDS URGED

Col. Arthur V. McDermott, N. Y. City Director of Selective Service in Bulletin to Agencies Favors Deferment of Students in Engineering and Chemistry and of Medical Students—Points Out Supply of Professionals Is Low in Many Scientific Occupations

As the result of a specific study by the Bureau of Labor Statistics for OPM which shows the supply of civil, electrical, chemical, mining, metallurgical, mechanical engineers and chemists to be at a dangerously low level, Col. A. V. McDermott, N. Y. C. director of Selective Service, has forwarded a bulletin to Selective Service Agencies favoring deferment of students in engineering and chemistry and of medical students in approved medical schools. Expressing this as a "national policy," Col. McDermott pointed out that national interest requires that these students be encouraged to continue their education in these fields.

Regarding students of chemistry and engineering, his bulletin declared that "in certain of these fields definite shortages of 'necessary men' already exist."

The report of the Bureau of Labor Statistics declared that "authorities consulted allege that a shortage will exist" in the following professional occupations although studies have not yet been made by the bureau: agricultural and sanitary engineering, dentistry, pharmacy, physics, biology and bacteriology, geology—geophysics, meteorology, hydrology, cartography and medicine.

Demands Transcend Supply

It was further stated in the report, "There is complete agreement among representatives of industry, of American colleges and universities, and of the practicing professional groups that the present and future demands of the national defense program for college-trained scientific personnel will transcend the normal supply of graduating students that comes onto the labor market at the close of the academic year."

GOVERNMENT

Inventory Control

Accumulation of unnecessarily large stockpiles of materials needed for defense production which might be subjected to priorities rulings was criticized from two directions last month. John D. Biggers, production chief of OPM, called such moves on the part of manufacturers "selfish practices."

Almost simultaneously, the national defense committee of NAM announced that it was taking a stand against hoarding critical materials and urged cooperation among industries and with the government. Hope was expressed that replacement materials might be introduced and full availability developed of materials for defense supply needs. A 7-point program was recommended by the association for this purpose.

OPM on May 1 revealed a new form of inventory control designed to prevent the accumulation of excess stocks and supplies. The control plan, which does not constitute mandatory, industry-wide allocations, provides that shipments of metals affected may not be made to customers in amounts which will increase their inventories to unnecessary levels. Producers, primary and secondary smelters, re-smelters, brokers, warehouse and wholesale distributors and processors and fabricators are required to comply with regulations and send in sworn monthly statements.

On the list are:

Antimony—Used in storage battery plates, for cable covering, in bearing metals and for hardening lead.

Cadmium—Used as an alloy of copper, in electroplating.

Chromium—Used in making stainless and other alloy steels; is largely imported.

Cobalt—Valuable for the manufacture of high-grade steels.

Copper, Ferrous Alloys, All Types—Includes ferrous tungsten, ferromanganese.

Iridium—One of the platinum metals, used as a hardening agent for platinum, in manufacture of surgical tools.

Iron and steel products, including rolled, drawn, forgings, castings and pig iron.

Lead.

Manganese or Spiegeleisen—Necessary in steel making.

Mercury—Military uses include manufacture of fulminate for explosive, drugs, anti-fouling paint for ship bottoms.

Molybdenum—Used for making special alloy steels, especially high-speed cutting tool steels.

Non-Ferrous Alloys, All Types—Including brass and bronze.

Tin.

Vanadium—Used in the production of special alloy, steels and irons.

Secondary metals, or scrap, containing any of the metals listed or already subject to control, prepared for sale in order to recover the metal content thereof.

Export License Control

Another proclamation made by President Roosevelt last month placed additional chemicals under export license control. Now on the list are caffeine, its salts and compounds, calcium cyanide, casein, sodium cyanide, theobromine, its salts and compounds. This proclamation which became effective May 6 also includes vegetable fibers and their manufactures.

Additional definitions of lead superseding prior rulings were included in the proclamation. License is now required for export of lead including antimonial, ore, matte, base bullion and other forms and a long list of manufactures.

A list of articles was published April 15 which require a license for shipment regardless of value. On the list were such names as atropine, belladonna, beryllium, bromine, etc., to uranium.

No Cargo Priorities

Complete cooperation of the American merchant marine in providing shipping facilities for strategic materials needed in the national defense program has led the government to abandon plans for import controls and ship cargo priorities. It has been suggested that a control agency be set up to determine what commodities may be admitted to this country.

Present system is for the defense agency to inform the Bureau of Emergency Shipping of its needs. The Bureau makes arrangements with steamship lines and decides which vessel is best able to carry the cargo in question.

Move Potash Offices

American Potash Institute removed its main offices April 26 to the American Chemical Society Building, 1155 16th st., Washington, D. C.

Commerce Bureau Reorganized

Reorganization of the Bureau of Foreign and Domestic Commerce went into effect last month, its purpose to increase the services of the bureau for both government and business. Carroll L. Wilson, newly-appointed director, announced that simplified executive direction and more concentrated effort in gathering, analyzing, interpreting and disseminating factors of national economy will be the result of the move.

Under its new arrangement, the bureau will have five major divisions: (1) research and statistics, (2) industrial economy, (3) regional economy, (4) international economy and (5) commercial and

economic information. There were more than 30 divisions in the old setup.

Charles C. Concannon, formerly chief of the chemical division, is one of eight "Industrial Consultants" whose work will be to make contacts with industry and to develop special reports.

J-Men Investigations

Temporarily stymied by lack of funds, the Justice Department stands ready to push forward its nation-wide investigation of foreign restraints on production of vital defense items. Congress has the appropriation bill for action.

The investigation which has been under way since 1939 disclosed in April that subpoenas had been issued for the records of a half-dozen chemical companies allegedly affiliated with German interests. Indictments thus far have been returned in New York involving military optical instruments, magnesium, tungsten-carbide, bentonite and magnesite.

Justice officials hold that their evidence tends to show that through patent licensing agreements, foreign corporations had restricted the quantity and quality of American productions of items of great military value, had gained access to American secrets, restricted American foreign markets, caused artificial shortages and raised prices.

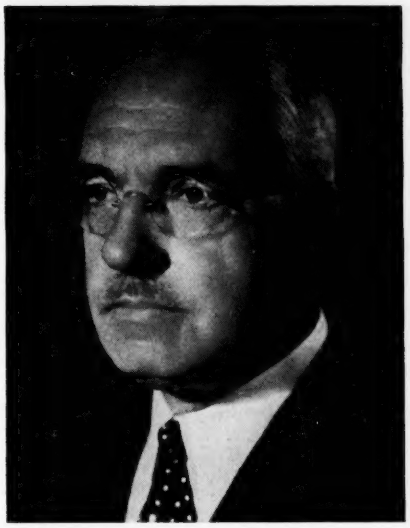
Government and Patents

Patents Committee of the House of Representatives is conducting hearings on two major bills designed to strengthen government control over patents and protect the defense program from patent holding difficulties. Both measures are being backed by the war, navy and justice departments and the Commissioner of Patents.

Warren M. Watson, secretary of the Manufacturing Chemists Association, voiced strong opposition last month to the proposed emergency legislation designed to give the government power to acquire through condemnation any patents necessary to the national defense program and outlawing injunction proceedings which might interfere with the use of any patent for defense purposes. His brief, filed with the House patents committee, held that existing legislation provides that whenever inventions are used in manufacture for or by the U. S. without license or lawful right, the remedy of the patent owner is by suit in the Court of Claims and not by injunction.

Paint for Defense

Representatives of all sections of the paint industry and of the National Paint, Varnish & Lacquer Association met in Washington last month to launch a broad campaign to insure the defense program against delays due to shortages of essential paints, varnishes or lacquers. Defense officials were present at the meeting which was held in the Office of Production Management.



Colonel Allan M. Pope, president of the First Boston Corporation, addressed the April meeting of the New York Section of the American Institute of Chemical Engineers at the Chemists' Club April 29, on "Investing in America's Future."

An advisory committee was planned, it was announced by Donald M. Nelson, through which the industry and government can work together. Personnel of the committee is to be announced.

J. B. Davis, special advisor on protective coatings, Division of Purchase, O.P.M. has announced the appointment of a Steering Committee. Work is proceeding along the lines of bringing into these activities representatives of the various branches of the industry, including manufactured goods and raw materials.

Synthetic Rubber Plants

Reconstruction Finance Corporation which last Fall shelved a proposal to construct stand-by synthetic rubber plants with government financing now is considering a similar plan which possibly calls for a joint venture shared by the government with leading chemical and petroleum companies. A cooperative movement has been designed, it is understood, to offset some of the difficulties encountered in the first proposal.

Government action in placing primary materials for the manufacture of synthetic rubbers under export license control was a conservation measure in this direction.

Other Developments

New naval stores act, effective May 1, has new regulations for enforcement replacing those issued in 1938. Principal changes are defining "spirits of turpentine" by reference to certain trade specifications; providing for sampling, grading and certifying rosin in bags; providing for weighing of rosin; revision of fees and charges for analytical work and for the use of duplicates of U. S. rosin standards.

Government officials are considering the extension of export controls to the Philippines in order to stop shipments of coconut oil and other strategic materials to Russia and the Axis powers. Legislation for this purpose is expected shortly.

GENERAL

Muriate Potash Production

Enlarged plant capacity for the production of muriate of potash is planned by the Potash Company of America, Carlsbad, N. M. Work will start immediately on a new unit to be in operation about Nov. 1941. Insurance against any possible shortage was given as the reason for the additional planned production capacity.

Plastics in Defense

Cooperation in the use of plastics in defense is the purpose of the new Plastic Materials Manufacturers Association formed last month by 15 of the major manufacturers. Arnold E. Pitcher, general manager of the plastics department of duPont was elected president. L. M. Rossi, vice-president of Bakelite, was named vice-president and John E. Walker was made secretary-treasurer.

Reduced Price Vitamin

Sustained interest in vitamin therapy, and the enriched flour program sponsored by the National Research Council have enabled Merck & Co., Inc., Rahway, N. J., to increase production of vitamin B_1, thiamine hydrochloride USP. The company recently announced a further reduction in price of this vitamin to 15 cents per gram. Ample stocks are available for shipment from Rahway, New York, Philadelphia or St. Louis.

M. I. T. President Speaks

Dr. Karl T. Compton, president of M.I.T., at the recent all-New England buffet supper held in the Hotel Washington, told the assembled group that if New England is to maintain its traditional reputation as the skilled workshop of the nation, New England management must take advantage of the improved processes and products made possible by modern research. He laid particular stress upon the ripeness of New England resources for synthetic fibres and the nonmetallic and refractory metals.

Paint Meeting at Chicago

Fifty-third annual meeting of the National Paint, Varnish and Lacquer Association will be held in Chicago Oct. 29-31 at the Drake Hotel. This meeting will follow the annual convention of the Federation of Paint and Varnish Production Clubs to be held at the Drake, Oct. 27 and 28.

A.I.Ch.E. Chicago Meeting May 19, 20, 21

Chemical engineers and chemical engineering students from all over the country will gather at the Edgewater Beach Hotel, Chicago, May 19, 20, 21 for the 33d semi-annual meeting of the American

Dr. Francis C. Frary

Institute of Chemical Engineers. General meeting is scheduled for the three days, students will meet on the 19th and 20th.

On the program, under the direction of Professor Harry McCormack, Illinois Institute of Technology, honorary chairman, and K. M. Watson, general chairman, are three days of technical sessions, luncheons, plant visits, dinners, and entertainment. Dr. Francis C. Frary, director of research, Aluminum Co. of America, will preside at the Monday and Tuesday technical sessions.

One of the features of the meeting will be the National Defense Symposium, scheduled for Tuesday morning, May 20, at which Dr. Gustav Egloff will preside. Subjects to be covered during the symposium include:

"Magnesium in the National Defense," by L. B. Grant, Dow Chemical (9:30 a.m.); "Petroleum and the War," by R. E. Wilson, Pan-American Petroleum (10:00); "Chemicals in the National Defense," by Walter S. Landis, American Cyanamid (10:30); "Plastics in the National Defense," by R. J. Moore, Bakelite (11:00); "Selective Service and Technical Manpower," by Major Joseph F. Battley, Occupational Adviser, National Headquarters Selective Service, Washington, D. C.

Special programs have been arranged for the ladies and students and a golf tournament also is scheduled.

All events are set for Central Daylight Saving Time.

A.I.Ch.E. Awards

The first two prizes of the A. McLaren White Award for 1941, highest student honor granted by the American Institute of Chemical Engineers, were won by two seniors of Clarkson College of Technology, Potsdam, N. Y. First prize went to E. Bruce Powell and second to Weller R. Pierce. Third prize went to Sidney M. Feldman of the College of the City of New York.

The Walker Award for outstanding contribution to chemical engineering literature was presented to Thomas K. Sherwood, associate professor of chemical engineering at Massachusetts Institute of Technology.

Defense Training

Columbia University School of Engineering instituted this month tuition-free defense training courses in the chemistry of explosives and metallurgical inspection. Approved by the U. S. Office of Education, requirements for the studies in explosives are two years of college chemistry for the "A" course, three years for the "B." Requirements for metallurgical inspection are a high school diploma, and as for the others, U. S. citizenship.

The explosive courses are designed to prepare men for work in explosives and loading plants as inspectors for ordnance departments of the services and as technicians and operators in laboratories and plants engaged in the production, analysis testing, control and inspection of explosives. Inspection in metallurgy course is to train men now employed in inspection work for increased responsibilities.

Luaces on Solvent Recovery

E. L. Luaces addressed the Student Chapter of the American Institute of Chemical Engineers, Brooklyn Polytechnic Institute, April 18. His subject was "Modern Technique for Solvent Recovery." On May 8 he spoke before the Junior Chemical Engineers of N. Y. City on "Active Carbon in War and Peace."

Southern "Ag Lab" Opens

Chemists, physicists and technologists moved into the chemical wing of the new Southern Agricultural Research Laboratory, New Orleans, La., last month to begin work on finding new industrial uses for cotton, sweet potatoes and peanuts. The industrial wing, which will house pilot plants, is expected to be finished shortly.

Seven divisions will be included when the entire laboratory is completed. These include cotton processing, cotton chemical finishing, cotton fiber research, oil, fat and proteins, analytical, physical-chemical and physical, sweet potato products, and engineering and development.

Sharples Changes Name

Sharples Solvents Corp., Philadelphia, last month changed its name to Sharples Chemicals Inc. According to N. J. Hooper, general sales manager, the change was necessary because of the transition in the nature of the company's business over the past few years.

Production of many new organic chemicals and the development of new uses for these materials, he said, has made it desirable for the company to be identified as a chemical company. Products for which the company has long been known, however, will continue to be manufactured as before.

Water Treatment and Defense

The great importance of water supply, sewage treatment and other phases of sanitation in the national defense program, and the need for enlarged facilities, are discussed in detail in the latest issue of "The Pioneer," monthly magazine of the Electro Bleaching Gas Co. and Niagara Alkali Co., N. Y. City. Copies may be obtained without charge by any user of liquid chlorine or caustics.

Dr. Bogert Honored

Ph.D. graduates of Marston T. Bogert, professor of organic chemistry at Columbia University since 1904, presented his portrait to the university May 2 in ceremonies at the Chemists' Club, N. Y. City. Dr. George D. Beal of Mellon Institute acted as toastmaster. Presentation was made by Dr. Michael Heidelberger of the Columbia University College of Physicians and Surgeons.

Consultants and Recovery

Current issue of *The Research Viewpoint* contains an article by Dr. Gustavus J. Esselen, president of Gustavus J. Esselen, Inc., Boston, Mass., entitled "The Consulting Research Organization in Defense and Recovery." Prepared at the request of the Joint Committee of the New England Council and the Engineering Societies of New England in connection with Research Day in New England, May 16, the article is available upon writing.

ASSOCIATIONS

Members of the American Section of the Society of Chemical Industry have been invited to be active participants in the joint convention this year of the Canadian Chemical Association, the Chemical Institute of Canada and the Society of Chemical Industry, in Quebec June 2 and 3. Dr. Wallace P. Cohoe, past chairman of the American Section will be the speaker. Dr. Lincoln T. Work, chairman of the American Section has been invited to act as chairman of the June 2, evening meeting.

Chemists' Club Elects

Walter S. Landis, vice-president, American Cyanamid, was elected 28th president of The Chemists' Club, N. Y. City, at its annual meeting May 7. Dr. Landis has been connected with American Cyanamid since 1912. He is a member of the American Chemical Society, American Institute of Chemical Engineers, American Institute of Mining and Metallurgical Engineers and the Electrochemical Society.

Other officers elected were: Robert L. Murray, Hooker Electrochemical, non-resident vice-president; Per K. Frolich, Standard Oil Development Co., suburban vice-president; and Charles R. Downs, Weiss & Downs, and Albert B. Newman, College of the City of New York, Trustees for three years. Re-elected were: Ralph E. Dorland, Dow Chemical Co., resident vice-president; Ira Vandewater, R. K. Greeff & Co., treasurer; and Robert T. Baldwin, secretary.

F. M. Becket, Union Carbide Co., retired after two terms as president of the Club.

New Fertilizer Pamphlet

The National Fertilizer Association, Washington, D. C., is distributing to members and contributors its new pamphlet 131, "Putting Plantfood to Work." Charge to members is $20 per thousand, according to Charles J. Brand, executive secretary and treasurer.

Bragdon Elected

C. R. Bragdon, Interchemical Corp., was elected president of the New York Paint, and Varnish Production Club, May 1. Vice-president is John A. Murphy, Standard Varnish; secretary, F. G. Schleicher, Wilson Printing Ink; and treasurer, Fred M. Damitz, formerly of Endurette Corp. who is starting in business for himself.

Change Tournament Club

June 10th Golf Tournament of the Salesmen's Association of the American Chemical Industry has been changed from the Wingfoot Country Club to the Bonnie Briar Country Club at Larchmont, N. Y.

Cunningham Promoted

Dr. G. L. Cunningham has been appointed manager of the technical service department, Pittsburgh Plate Glass Co., Columbia Chemical Division.

OBITUARIES

Dr. A. M. Muckenfuss, 72, research chemist and retired professor of chemistry from the University of Florida, died April 17 at Gainesville, Fla.

Milton W. St. John, 52, Manager of Sales, By-Products, Jones & Laughlin Steel Corp., Pittsburgh, died May 1 after a short illness.

John H. Taft, retired president of Pierre Chemical Co., Evanston, Ill., died suddenly April 16 when he succumbed to a heart attack. He would have been 79 on April 27.

Oscar C. Huffman, president of the Continental Can Co. and a member of the War Industries Board during the World War, died May 5 at the Hotel Savoy Plaza, N. Y. City, after an illness of three weeks. His home was in New Canaan, Conn.

Carl. G. V. Sjostrom, 82, president of the Springfield, Mass., company bearing his name, died April 11. Mr. Sjostrom had devoted his entire career to the dyeing industry and was a charter member of the American Association of Textile Chemists and Colorists.

Maj. Gen. Walter C. Baker, chief of the Chemical Warfare Service, retired April 30 from active duty after having served in the service since 1920. No successor has been named as yet.

COMPANIES

General sales office of the Potash Company of America was transferred to 50 Broadway, N. Y. City, May 1. George E. Petitt, vice-president in charge of sales will head the New York staff and a regional office will be maintained in Baltimore under the direction of F. E. Smith, Jr.

Willis J. Kramer, above, has been made general manager of the chemical department of Philipp Bros., Inc., 70 Pine st., N. Y. City. For the last 10 years he was assistant manager of the chemical division of American Agricultural Chemical Co.

Calorider Licenses

Nine companies to date have been issued licenses under various patents pertaining to air conditioning and catalytic processes by the Calorider Corp., Stamford, Conn., according to an announcement by C. R. Downs, president. Licenses are available to other responsible companies.

Companies listed in the Calorider announcement include: Bendix Aviation, Detroit Lubricator, General Air Conditioning, Hercules Powder, Koppers Co., Research Corp., Solvay Sales, Texaco Development and U. S. Industrial Alcohol.

J. M. Weiss is first vice-president and Chester E. Rahr second vice-president of the company.

Other Company Briefs

G. S. McCarty, president of Carolina Aniline & Extract Co., Charlotte, N. C., and four associates recently purchased the capital of the company. Larger quarters have been secured and modern equipment installed.

S. B. Penick & Co. has moved to new headquarters at 50 Church st., N. Y. City.

George H. Lincks, importer and distributor of "all the known gums," has moved his office from 123 Front st., N. Y. City, to 155 John st.

Great Lakes Carbon Corp. has moved its office to 22 East 40th st., N. Y. City, 38th floor.

Industrial Sales Corp., exporters of industrial chemicals and importers of basic raw materials, moved May 1 to 295 Madison ave., N. Y. City. Firm is also exclusive sales agent for Jefferson Lake Sulphur Co. and Carbon Black Export Association for their business with India.

Millmaster Chemical Co., distributor of fine and industrial chemicals with offices at 551 Fifth ave., N. Y. City, has been named sole selling agent for Berkeley Chemical Corp., which expects this month to complete a new unit to its plant at Berkeley Heights, N. J.

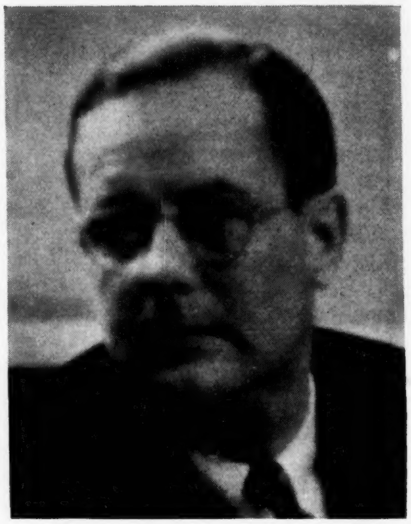
Providence Drysalters Division plant, Hercules Powder Co., Providence, R. I., has been sold to Arnold, Hoffman & Co., Inc., manufacturing chemists. Textile chemicals, formerly manufactured at the plant will be removed to Arnold, Hoffman's Anchor Color & Gum Works, Dighton, Mass., and manufactured there with the company's other products.

New distributor of Diamond Alkali's chlorinated solvents, carbon tetrachloride and Diamond dry cleaner, is Commerce Petroleum Co., 2923 South Lock st., Chicago, Ill.

Minerals Trading Corp., dealers in fillers, wood flour and diatomaceous earth, has moved from 17 Battery place to 95 Broad st., N. Y. City. Telephone number, Whitehall 4-3926, remains the same.

CONSTRUCTION

F. J. Stokes Machine Co., Philadelphia, recently completed construction at its Tabor Road Plant, of a new brick and concrete addition which increased floor space more than 50% and provided facilities and machine tools for the manufacture of processing equipment, water stills, high vacuum pumps and other specialized Stokes equipment.



Frederic A. Prisley, Chief Chemist, Schuster Woolen Mills, East Douglas, Mass., was guest speaker at the April meeting of the American Association of Textile Chemists and Colorists at the Chemists' Club, N. Y. City.

Construction will begin immediately on a new neoprene synthetic rubber plant at Louisville, Ky., to be built, financed and operated by du Pont. Capacity of the new plant will be 10,000 long tons a year.

The Barrett Co., Phila., has acquired additional land adjacent to its Frankford plant for the expansion of its coal tar chemical business. More than double the present plant facilities for the production of phthalic anhydride will be the result.

Check These Results Against Your Experience

¶ **The drug, chemical and allied trades industry is not experiencing serious inconvenience through loss of labor to the draft thus far.**

¶ **The industry generally expects serious shortage of labor particularly in the skilled classifications.**

¶ **Approximately half of the industry has instituted training programs to meet the problem of labor replacements.**

¶ **The industry is losing a small percentage *to date* of its workers to other defense industries.**

¶ **Private agencies are best in supplying needed common labor but skilled labor is not generally obtainable in satisfactory amounts through any agency.**

¶ **Government defense contracts are held by approximately one-third of the industry but in amounts of 10 per cent. or less per company.**

¶ **Replies indicate that the skilled labor of some companies is experiencing difficulties in obtaining deferment.**

Above is a brief digest of the results of a questionnaire mailed to the 322 members of the Drug, Chemical and Allied Trades Section, N. Y. Board of Trade, seeking to determine what effect so far the operation of the Selective Service Act has had on the drug and chemical fields.

At the time the questionnaire was mailed approximately only 300,000 men had been drafted. The questionnaire dealt only with skilled and unskilled labor not with professional groups such as chemists and chemical engineers. The complete report of the committee is available by writing John C. Ostrom, Secy., 41 Park Row, N. Y.

Washington

By

MACK H. WILLIAMS

NEW Dealers who talk of revamping the business community along extreme lines after the war are now in position to do so.

In the key spot of price administrator, is Leon Henderson, leading planner of the Administration's New Deal core, with the power to carry out his theories.

The result of his activities may be an unparalleled expansion and duplication of industrial facilities, brought on by war needs but retained after peace comes in order to ease out the price system as it is now known.

Henderson's declarations that chemical prices are too high brings this industry into the group that will be most affected by the change. His theory is that they can be brought down by making supplies adequate—and that supplies can be made adequate by building many new processing plants and developing sources of raw materials.

Mack Williams

Government financing, Treasury stockpiles, and yardsticks like TVA are to supply the impetus for expansion. Patent controls are to be reduced to bring about what Henderson calls untrammeled expansion but what industry maintains is duplication of effort and breaking down of private enterprise.

The post-war picture will be different, and the "return to normalcy" of the 1920s will not occur again. Inflated industry will not be permitted to return to peacetime levels of output, but will be called upon to operate under a theory of abundance for the consumer that has been taking form throughout the New Deal years.

Whatever business influence once prevailed in Washington is too negligible to block this planning. The Knudsens who were called in to put production on a war footing are out of the limelight now that the task has been completed. With "tooling up" over, only assembly line adjustments remain, and New Dealers have taken the leadership in the defense effort from business men.

The Current Program

To keep prices down during the emergency, Henderson is relying on maximum price schedules for scrap and secondary metals and "suggestions" through his Office of Price Administration that producers and dealers in other materials discourage price spiraling.

The order freezing iron and steel prices provoked some resentment among steelmakers, faced with rising labor and production costs, and they talked of challenging in court the authorization for the OPACS. No legislation was utilized to set up the group, merely a presidential order.

But Henderson's readiness to seek the necessary legislation from Congress discouraged the movement. As a source close to him expressed it: "He can ride up to the Capitol the minute any business man takes the question of legality to court and end the argument by getting a law passed."

Henderson's power, from the standpoint of securing compliance with his orders, rests in the executive authority delegated to him to deny transportation facilities to uncooperative companies and publicize them as unpatriotic.

At this writing, Henderson's emergency price controls have been restricted largely to metals and tools. His invasion of the field of chemical raw materials will be timed with the expansion of our aid-Britain effort.

On the same basis is the rate at which the Office of Production Management will approach the "total priorities" advocated by Bernard Baruch, now the President's close adviser on industrial operations during wartime. Baruch urges that priorities be established not only on plants and facilities but fuel supply, electrical energy, transportation and access to capital markets wherever necessary.

Extension Is Certain

That priorities, or limited forms of precedence, will be set on all items that go even indirectly into war goods production is the accepted belief in Washington.

Inventory restrictions can be expected to supplement the price and precedence rules. The first step in this direction was taken by E. R. Stettinius, Jr., priorities director, in connection with 16 metals, including lead, tin, copper, iron and vanadium. It reveals the system that will be used for other materials. Purchasers of the affected products must disclose their inventories to the supplier before they can obtain additional shipments.

The supplier, in turn, is restrained from delivering if he considers the customer's inventory adequate to meet the latter's existing contracts. As a further check, both must file statements of their reserve stocks with the priorities division.

What constitutes an "adequate" supply is of course the center of a controversy. Involved are various factors, including the reluctance of the supplier to offend his customer and his honest lack of knowledge of the latter's inventory problems.

With these and other far-reaching developments in Washington affecting the daily conduct of business, and making it necessary that business men act in concert, the Justice Department's new interpretation of the anti-trust laws comes as welcome relief.

Attorney General Jackson holds that distribution of orders among a group of producers, curtailment of some kinds of production and price ceilings when dictated by the OPM and Henderson's OPACS will not be considered violations of the trust laws.

Industrial committees may be formed at the request of either agency, providing they confine themselves to collecting and analyzing information and making recommendations, Jackson ruled. A committee "shall not undertake to determine policies for the industry, nor shall it attempt to compel or coerce any one to comply with the request or order made by a public authority."

Draft Law Change?

The automatic selective service exemption for students expires July 1, but the Selective Service Headquarters, before that time, may reclassify chemical, mineral and metallurgical students who are in line for induction.

The action to defer them to class 1-D is favored by the Selective Service leaders, it is reported, because of an OPM survey showing that defense industries will bog down unless an uninterrupted stream of trained graduates can be allowed to flow from the universities.

Information Clearing House

Unit of Conservation, division of OPM, announced last month that it intended to act as a clearing house of information for manufacturers and merchandisers on the materials situation and methods of conservation. Purpose is to give information to indicate procedure for conserving critical and strategic materials and assure adequate supplies of products for customers.

More New Construction

Construction will begin shortly on a new plant to be ready by Feb. 1, 1942, the Helena Manganese Co., Helena, Ark. An agreement has been made with the Metal Reserves Co. for the purchase of 100,000 gross tons of manganese between Feb. 1, 1942 and Dec. 1, 1944.

Reilly Tar & Chemical Co., Indianapolis, shortly is beginning construction of a new plant for processing coal tar at Belle, W. Va. Production will involve the processing of coal tar, manufacture of intermediate products and some finished products.

Rademaker Chemical Corp., Eastlake, Mich., has been granted a $300,000 RFC loan to build and equip a plant for the manufacture of dead-burned magnesite.

Wallerstein Co., Mariners Harbor, S. I., recently completed construction of a new laboratory. New equipment provides greater facilities for the production of enzyme products.

Foxboro Co., makers of instruments for measurement and control, began construction recently on new buildings in Pittsburgh where servicing department and offices will be located after May 15.

PERSONNEL

Capt. E. C. Phillips, Stroock & Wittenberg Corp., has been recalled to active service by the U. S. Army and is now with his regiment, 101st Cavalry, Fort Devens, Ayer, Mass. . . . **Carson G. Frailey,** Albee Bldg., Washington, D. C., has been appointed by the Drug, Chemical and Allied Trades Section of the New York Board of Trade to handle certain sectional affairs pertaining to the government.

W. J. Thorn, in charge of Innis, Speiden & Co.'s talc department, left for the Pacific Coast last month to inspect several properties from which the company secures its talc supplies... **Harlowe Hardinge,** president and general manager of Hardinge Co., Inc., and his wife spent a vacation touring in the Southwestern states and Mexico during April, returning after several weeks in Mexico to their home in York, Pa.

L. M. Lindsey, formerly Surface Combustion Corp., has been appointed engineering sales manager of General Alloys Co., Boston . . . **Roger Sutton,** for the past eight years metallurgist with Chrysler Corp., is now director of engineering and metallurgy for the company . . . **Hal G. Chase,** newly-appointed assistant to the president, has come to the Boston office to help out with defense program business . . . **Donald F. Carpenter** was elected a vice-president of Remington Arms Co., Inc., Bridgeport, Conn., last month. He will continue to direct all manufacturing and technical activities of the company . . . **Chaplin Tyler,** assistant director of public relations for Du Pont, has been made director of public relations of Remington Arms, Bridgeport, Conn.

Charles J. Kiger was promoted recently to the position of sales manager of the Owens-Illinois prescription ware division succeeding **William T. Allen** who has resigned . . . **F. A. Lang,** operating manager of the mechanical division of B. F. Goodrich is now in charge of rubber heel and sole sales, formerly carried by M. D. Maskrey who has resigned . . . **Ralph L. Ericsson** has been added to the Commercial Solvents Trade Relations Division, Terre Haute, Ind., where he will be chiefly concerned with advertising and sales promotion.

O. P. Clipper, formerly with the Glidden Co., is now on the staff of the Plaskon Co., Inc., Toledo, where he will assist in the development of urea formaldehyde resins for the paint trade. He will be associated with **Dr. A. M. Howald,** one of the foremost authorities on urea formaldehyde resins in this country . . . **Ralph A. Hayward,** president of the Kalamazoo Vegetable Parchement Co., was cited last month for distinguished service in chemical engineering at the Engineering Alumni Conference of the University of Michigan

H. L. McNally has been appointed sales manager of the Westco Pump Division, Micro-Westco, Inc., Bettendorf, Ia. . . . **Leon F. Wernentin,** former sales manager has been promoted to the sales department of the Bettendorf Co., parent organization. . . . Two new sales engineers have been added to the force, **C. V. Copeland** and **Ivor G. Morgan,** who will assist Mr. McNally in the promotion of domestic and industrial turbine-type and centrifugal pumps.

Robert A. Kramer, manager of the chemical department of the Th. Goldschmidt Corp., N. Y. City, has resigned from that company to assume the position of sales manager of Evans Chemetics, Inc., 33 West 46 st.

Schnell Buys OPD

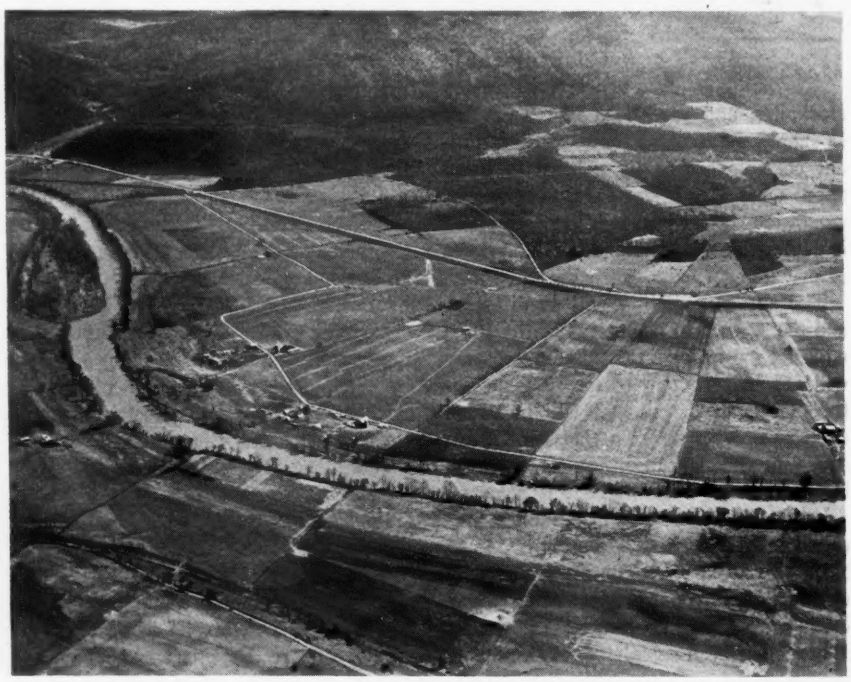
Harry J. Schnell, for many years president and editor of Oil, Paint & Drug Reporter, the Green Book Buyers Directory and National Painters Magazine, recently purchased the group from the Oil, Paint and Drug Publishing Co. Mr. Schnell has been an active leader in trade associations of these industries and is a former president of the Drug and Chemical Club of New York. Policy, personnel and management will remain the same, it was announced.

Doriot Re-Elected

In accordance with a stockholders vote at the annual meeting in Pittsburgh recently, National Can Corp. last month succeeded McKeesport Tin Plate Corp.

(*Continued on page 647*)

New Merck Plant at Elkton, Va.



Shown above is an aerial view of the 312-acre site of the new Stonewall Plant being erected by Merck & Co., Inc., at Elkton, Va. Initial plans include the construction of a power plant, a service building, a warehouse, machine shop and several manufacturing units for the production of vitamins and other chemicals, some of which are important to the defense program in relation to the medicinal and health requirements of the nation.

 Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

May ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1941

Reactions of Ethyl Formate Allow Many Organic Syntheses

U.S.I. Product Also Extensively Used as Larvacide and Fumigant

Interesting possibilities for many types of organic syntheses are offered by ethyl formate, a very reactive ester produced by U.S.I. For example, ethyl formate condenses with various other esters in the presence of sodium ethoxide (sodium ethylate) in the following typical reactions:

1. With ethyl succinate to give ethyl formylsuccinate.
2. With ethyl beta-ethoxypropionate to give ethyl alpha-formyl-beta-ethoxypropionate, an intermediate in the synthesis of Vitamin B_1 (Thiamin).

Ethyl formate is an excellent fumigant for treating tobacco and food products.

3. With ethyl acetate in the presence of metallic sodium in benzene to give the sodium compound of ethyl formylacetate, which in turn may be converted to ethyl alpha-formylglutaconate (ethyl coumalate) and ethyl 1, 3, 5-benzene tricarboxylate (ethyl trimesate).

Similarly, ethyl formate may be condensed with ketones in the presence of sodium ethoxide to give hydroxymethylene ketones (also

(Continued on next page)

Improves Waterproofing Of Textiles with Butanol

DOVER, Del.—That improved results in the familiar process of waterproofing textiles by aluminum acetate can be obtained through the use of butanol (normal butyl alcohol) is claimed in a patent assigned to a manufacturer in this city.

When added to an aqueous solution of the aluminum salt, the butanol is said to lower the surface tension of the solution, allowing it to penetrate the textile more effectively.

A typical procedure is described as consisting of adding 8% butanol to a 3% solution of aluminum acetate in water.

Suggests Acetone-Ether Mixture to Dry Glassware

SEATTLE, Wash.—A mixture of acetone and ether is more satisfactory than acetone alone for drying glassware, it has been reported here.

A mixture of equal parts is said to have considerably higher vapor pressure than acetone, thus promoting rapid evaporation.

U.S.I. Adopts Revised System Of Nomenclature for Products

Changes Made in the Names of Many Solvents and Chemicals In Order to Promote Interests of Simplicity and Uniformity

As a step to bring about a simpler, more uniform method of designating organic compounds, U.S.I. has revised the names of its products to conform with the "Definitive Report of the International Committee on Organic Nomenclature." This system has been adopted by the American Chemical Society, and is followed by Chemical Abstracts and many other publications in the chemical field.

Because of the rapid growth of the science of organic chemistry, the question of nomenclature has presented a definite problem. It is estimated that over 300,000 organic compounds have been prepared, and the number is constantly increasing. All of these compounds are more or less related, and the task of naming them is a difficult one.

A complete list of the U.S.I. products for which new designations have been adopted will be found in the continuation of this article on page 2 of this issue of U.S.I. CHEMICAL NEWS.

In the early part of the last century, the names of organic compounds were usually based on their origin, applications, or properties. As the existence of relationships between compounds was discovered, related substances received the same endings: as, aniline and quinoline; acetic, oleic, and benzoic acids.

As organic chemistry developed, the systems of nomenclature increased in number and were adapted to meet the needs of the science. With the present large number of compounds, the need of a uniform method of accurate naming is obvious. Two general systems are in use today.

Substituent System

The first of these is the radical system, the second the substituent system. In the substituent system, the atoms or groups which are considered as replacing hydrogens in the fundamental portion of a formula are written in front of the name of the fundamental portion. Thus, the compound designated as methyl chloride in the radical system is named chloromethane in the substituent system.

(Continued on next page)

Rubber-Like Synthetics Resist Solvent Action

NEW YORK, N. Y.—How synthetic substances that resemble rubber in softness and flexibility, but are insoluble in solvents, can be prepared from derivatives of polyacrylic acid is revealed in a patent assigned to a manufacturer here.

A novel feature of the process, according to the patent, is that the product is insoluble even in the solvents used to dissolve the polyacrylic acid derivative as the first step in the process.

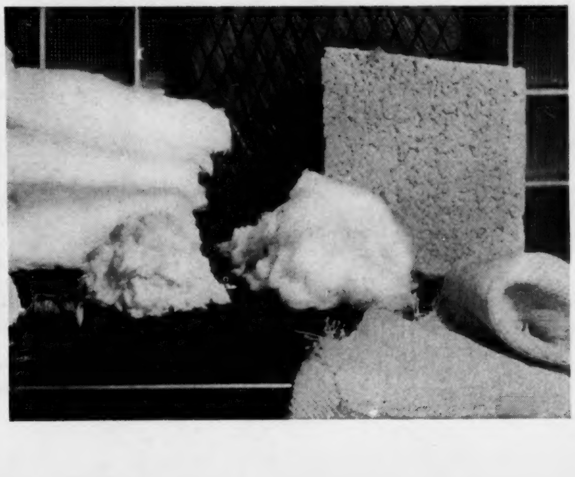
Essentially, the method is described as dissolving a compound such as polyacrylic acid methyl ester in ethyl acetate and adding a finely divided metal or metallic compound. In other cases acetone may be used as the solvent. The resulting product, it is claimed, may be easily formed into tubes, bands, or filaments. The process is also said to be adaptable to coating fabrics.

Fast-Drying Sympathetic Ink Made with Ethanol

WILMINGTON, Del.—A fast-drying ink of the sympathetic type can be formulated with the aid of ethanol (ethyl alcohol) and natural gums, synthetic resins, or ethyl cellulose, according to a patent granted to an inventor here.

The ink, it is said, can be printed from a rubber roll. It is normally invisible, but becomes visible when the materials are wetted. In one suggested formula, one part of Manila gum is dissolved in 25 parts of ethanol. In another instance, one part of ethyl cellulose is dissolved by heating in 50 parts of ethanol.

Glass textiles are constantly growing in popularity because of their chemical inertness, high strength, and resistance to actinic rays, fire, and attack by fungi. A recent patent reveals that woven glass fabrics can now be coated with compositions based on cellulose derivatives. A typical formulation is said to consist of cellulose nitrate, butyl phthalate (dibutyl phthalate), pigment, ethyl acetate, and ethanol. It is said that the coating may be applied by any of the common methods for coating fabrics, such as doctor knife or roller coating. Variations in translucency can be obtained by regulating the index of refraction of the coating.



May ★ **U.S.I. CHEMICAL NEWS** ★ 1941

U.S.I. Makes Changes in Product Nomenclature

(Continued from previous page)

The radical system becomes very cumbersome when the size of the formulas increases beyond those of the simplest compounds. For this reason the substituent system, as laid down by the International Committee and adopted by the A. C. S., offers the most satisfactory means of using the best name.

Application to U.S.I. Products

As a result of U.S.I.'s adoption of this system, revised names will be employed for many U.S.I. products. The new names will be employed on labels and in U.S.I. CHEMICAL NEWS and U.S.I. ALCOHOL NEWS, as well as other company advertising and literature. Where an older name has been in common use, it will be added in parentheses.

The following exemplify the changes:

Old Name	New Name
Ethyl Alcohol	Ethanol
Isopropyl Alcohol	Isopropanol
Normal Butyl Alcohol	Butanol

The name *isopropanol* may be regarded as an extension of the Geneva system, formed by analogy with the names of other alcohols. Because of its widespread use, the name "Ethyl Alcohol" will still be employed in many cases.

Old Name	New Name
Diamyl Phthalate	Amyl Phthalate
Diethyl Carbonate	Ethyl Carbonate
Diethyl Maleate	Ethyl Maleate
Diethyl Oxalate	Ethyl Oxalate
Diethyl Phthalate	Ethyl Phthalate
Dibutyl Maleate	Butyl Maleate
Dibutyl Oxalate	Butyl Oxalate
Dibutyl Phthalate	Butyl Phthalate
Dimethyl Maleate	Methyl Maleate
Dimethyl Phthalate	Methyl Phthalate

In all of the compounds listed, the prefix "di" is really superfluous. When a single group is named in connection with the acid, it is assumed that all of the ionizable hydrogens have been replaced by the group. This is in keeping with inorganic nomenclature; for example Na_2SO_4 has always been sodium sulphate, not *di*sodium sulphate. This revised nomenclature introduces no conflict with the names of mixed compounds, such as Ethyl Hydrogen Phthalate or Ethyl Butyl Phthalate.

Other changes in product names are:

Old Name	New Name
Ethyl Chlorocarbonate	Ethyl Chloroformate
Sodium Ethyl Oxalacetate	Ethyl Sodium Oxalacetate
Acetoacet Arylids	Acetoacet-arylides
Urethane	Urethan

By employing familiar designations in parentheses, U.S.I. believes that the transition in nomenclature will be facilitated.

Refine Ester-Type Oils With Imines and Ethanol

THE HAGUE, Netherlands—Success in the refining of oils, fats, and waxes of the ester type is promised by a process patented by an inventor here.

According to the claims of the patent, it has been difficult to remove from ester-type oils the various impurities that frequently result in undesirable odor or color. By employing certain imines in mixture with ethanol, a very high degree of selective separation is said to be obtained.

Uses of Ethyl Formate

(Continued from previous page)

known as beta-ketoaldehydes). For example, reaction with acetone gives the sodium compound of hydroxymethylene-acetone. From this may be obtained by acidifying, triacetylbenzene; by reacting with hydrazine, 3-methylpyrazole; and by reacting with hydroxylamine, methylisoxazoles.

Miscellaneous Reactions

Among the miscellaneous reactions of ethyl formate are:

1. With anhydrous ammonia in ethanol to give formamide.
2. With ethylmercaptan and hydrochloric acid to give ethyl ortho-thioformate.
3. With hydrazine to give formylhydrazine (from which may be obtained triazole) and diformylhydrazine.

For Treating Tobacco and Fruit

In addition to its use in synthesis, ethyl formate has been found by experience to be an excellent larvacide and fumigant for treating tobacco, dried fruits, cereals, and other products which may be subject to infestation. Because it evaporates completely, leaving no residual odor, it is suitable for use on the packing line for fumigating individual packages. It has been used in pharmacy, internally for diarrhea, externally as a rubefacient, and as an inhalant in respiratory affections.

U.S.I. will gladly give additional information on ethyl formate.

Formula for Leather Varnish

A varnish described as suitable for use on leather is prepared by dissolving 20 parts of shellac in 80 parts of ethanol and adding:

	Parts
Castile soap	25
Ethanol	320
Glycerine	40

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new wetting agent is described as non-ionic and therefore compatible with almost any type of material. It is said that a 3% concentration in water reduces surface tension from 72 to 30 dynes and that the material is miscible with alcohol. **(No. 450)**

U S I

A finish remover can be used without injury to the surfaces of wood, metal, fabric, or leather, the maker claims. It is said that the material leaves no wax deposit, and that paint, lacquer, enamel, or shellac can be applied immediately after removal of old coatings. **(No. 451)**

U S I

A new material for treating vulcanized rubber molded goods is said to destroy tack and increase polish. According to the maker, material is suitable for use on neoprene goods also. **(No. 452)**

U S I

Individual watermarking of paper of any quality or grade is reported to be made possible by a new process. Manufacturer of the watermarked paper says that it is suitable for business stationery, documents, and other paper products. **(No. 453)**

U S I

A new resin is said to be especially designed for use in tung oil substitution formulations. It is said to confer superior bodying to the vehicle and to increase drying speed and film hardness. **(No. 454)**

U S I

A molding compound is said to be suitable for the production of molded parts requiring high impact resistance and minimum frictional resistance. Material is said to have a particle size comparable to dry rice. **(No. 455)**

U S I

Corrosion protection is said to be afforded by new products utilizing polar molecules to prevent electrolytic action. It is claimed that the new compounds produce thin, adherent films that protect the metal, and can be washed off with solvents if desired. **(No. 456)**

U S I

A fractionating pump is said to be constructed entirely of metal for service where a particularly rugged unit is needed. It is reported that the pump is adapted to most vacuum systems. **(No. 457)**

U S I

A soldering flux is said to facilitate the application of silver soldering to a wide range of metals, including carbon steel, stainless steel, nickel, copper, brass, and bronze. Material is in paste form for application by brush, it is reported. **(No. 458)**

U S I

A marking ink for steel can be applied in the form of identification markings, trade-marks, or decorative designs, it is reported. Maker claims that the imprint is permanent and non-corrosive, and that ink can be applied to stainless, high speed, and low carbon steels. **(No. 459)**

CHEMICAL SPECIALTY *News!*

Tarlene, an instant acting solvent for hard-to-get-off road tar is a product of The Curran Corp., Malden Mass. (Gallon size is shown.) Comes packaged in two new three-color lithographed cans. It is also a basic ingredient for special carburetor and fuel pump tank baths.

Twenty-seventh Semi-Annual Meeting of National Association of Insecticide & Disinfectant Manufacturers at Chicago June 9 and 10—Winners of Nopco Bowling League Tournament—New Tar Solvent—Official '41 Test Insecticide for Distribution

TWENTY-SEVENTH semi-annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc., will be held at the Edgewater Beach Hotel, Chicago, June 9 and 10. Two full days divided up into four business sessions are planned, to be preceded by a meeting of the Board of Governors June 8 at 5 p. m. General convention arrangements are in charge of N. J. Gothard, Sinclair Refining Co., East Chicago, Ind. Program is in charge of R. F. Neptun, Allaire Woodward Co., Peoria, Ill.

Among the speakers, guests and members, are the following (titles of subjects are given, but dates have not as yet been set):

Guests: C. O. Auslander, Purchasing Agent, Michael Reese Hospital, Chicago, Ill., "Hospital Sanitation"; Dr. R. C. Roark, Bureau of Entomology & Plant Quarantine, U. S. Department of Agriculture, Washington, D. C., "Control of Houseflies, Cockroaches, and the Household Insects with Smokes Containing Pyrethrum, Derris and Certain Synthetics"; Chas. B. Dunn, General Counsel, Federal Reserve Bank, Chicago, "The Federal Reserve System and the Present Monetary Situation"; Discussion on State Insecticide & Fungicide Laws by J. M. George, Secretary Interstate Manufacturers Association, Winona, Minn., and H. C. Fuller, N.A.I.D.M., Consultant, Washington, D. C.; Dr. G. J. Hucker, Bacteriologist, Cornell University, Ithaca, New York, "Disinfection"; Dr. Fred A. Russell, University of Illinois, Urbana, Ill., "Marketing"; Dr. F. L. Campbell, Ohio State University, Columbus, O. Dr. Campbell will make his final report on the NAIDM Fellowship on "Liquid Insecticides Against Crawling Insects."

Members: C. S. Corl, Allaire Woodward Co., Peoria, Ill., "A 20-year Picture of Pyrethrum Prices and Scientific Investigations"; H. E. Whitmire, Whitmire Research Corp., St. Louis, Mo., "A Study of Correlation between Repellance and Natural Evaporation of Commonly Used Livestock Base Oil"; Dr. Alfred Weed, John Powell & Co., New York, "Deterioration of Powdered Pyrethrum"; Dr. Thomas Carpenter, Sinclair Refining Co., East Chicago, Ind., "Household Sprays for Plant Purposes"; Discussion of Coloration of Poisonous Insecticide Powders—Ira P. MacNair, MacNair-Dorland Co., New York; Disinfectant Scientific Section, under Dr. E. G. Klarmann, Lehn & Fink Co., Bloomfield, N. J.—discussion on "Footbath and Floor Fungicides" and other matters; Insecticide Scientific Section, under Dr. A. E. Badertscher, McCormick & Co., Baltimore, Md.—various insecticide matters, including Cattle Spray Methods of Testing by F. C. Nelson, Stanco, Inc., Elizabeth, N. J., Mothproofing Investigations by F. W. Fletcher, Dow Chemical Co., Midland, Mich. Sanitary Specialties Scientific Section under Dr. R. B. Trusler, Davies-Young Soap Co., Dayton, Ohio. Legislative Matters by C. L. Fardwell (Chairman, Legislative Committee) of McCormick & Co., Baltimore, Md.

1941 Test Insecticide

Official 1941 Test Insecticide for testing fly sprays by the Peet-Grady Method, June 1, 1941, to June 1, 1942, will be available for distribution about May 20th. Orders may be sent to the office of the National Association of Insecticide and Disinfectant Mfrs., 110 E. 42 st., N. Y. City.

Prices set by the Board of Governors in December 1940, the 1941 Official Test Insecticide are $5.00 per dozen 6 ounce bottles to members of the association, plus delivery charges; and, to those outside of the membership there is a service charge of $1.00 per dozen, or $6.00 per dozen to non-members, plus delivery charges. The single 6 ounce bottle will be $1.00, plus postage, the same as heretofore.

Members of the bowling team representing vice-president G. D. Davis won this year's league championship of the National Oil Products Co., A. A., Harrison, N. J. A silver loving cup was presented to Charles Augustine, captain of the winning team by Charles P. Gulick, president and chairman of the board, at the annual bowling dinner marking the season's close. Teams with their respective officer-backers are shown above, from left to right: Joseph Nothum, representing Treasurer Ralph Wechsler; Charles Augustine, representing Vice-President G. D. Davis; Gus Beck, captain of Vice-President T. A. Princeton's team; Al Lelong, representing Vice-President Perc Brown; William Tango, representing Secretary A. A. Vetter, and Michael Tango, captain of President Charles P. Gulick's entry.

Markets in Review

Heavy Chemicals • Fine Chemicals • Coal Tar Chemicals • Raw Materials • Agricultural Chemicals • Pigments and Solvents

By Paul B. Slawter, Jr., Asst. Editor

INDUSTRIAL activity and general business after having taken one step forward in February and March reaching the highest levels in 11 years, took two steps backward in April, then set about to recover lost ground. Strikes, especially the recently-settled coal strikes, took their toll of progress in industry. This department is informed that the steel industry, just to name one affected, may take at least another month to expand its production to reach the 99.8 per cent. peak of capacity it was enjoying when it had enough fuel to operate. By the end of April, however, production had reached 96.8% of capacity. One good thing happened for the steel industry—many furnaces were relined and repaired during the forced shutdowns. Industrial executives' nerves shortly will be up for relining and repairing if anything else happens to impede production, it is felt.

Other industries were not so fortunate as to be able to make use of borrowed time like the steel industry. Strikes and shortages of ships continued to confront the chemical industries. The labor situation came closer to home as chemical manufacturers began to announce difficulties with their help. However, it takes more than three strikes to put you out in this game. Early and amicable settlements are looked for.

Heavy Chemical Consumption

Heavy consumption of chemicals continues in every branch of industry. Textile and shoe industries show increased activity with each week. Cotton consumption rose to a record level last month and rayon deliveries increased although it has been reported that many mills which were making spun rayon cloths last year have gone back to production of cotton cloth for defense markets. Some strikes in rayon factories were reported. The rubber industry, spurred on by automobile production, greater replacement tire sales and 60 per cent. greater tire exports to China by way of the Burma Road, is operating at a higher level than it has in many years. Paper mills report peak capacities and are not selling any forward quantities to any great extent.

OPM this month acted to prevent the accumulation of unnecessarily large stockpiles with a new form of inventory control. On its list were 16 metals from antimony to vanadium, including certain classes of these metals. Another proclamation by President Roosevelt placed under export license control caffeine, its salts and compounds, calcium cyanide, casein, sodium cyanide, theobromine and its salts and compounds. Vegetable fibers also were included.

Water Freight Rates Frozen

Toward solving the problem of alleviating our pressing problem of ships, the Maritime Commission tossed in a bombshell this month when it froze existing water rates and served notice on all steamship companies and vessel owners that any proposals contemplating further increases in transportation rates would be viewed as unjustifiable. It charged that transportation rates already had reached the maximum under present conditions.

Important Price Changes

ADVANCED

	April 30	Mar. 31
Alcohol, gal.	\$0.36½	\$0.32½
Solvent, tks.	.28	.25½
Citral	2.75	2.50
Codliver Oil, U.S.P., bbl.	80.00	67.00
Dried Blood, unit		
Dom.	3.25	2.85
Egg Albumen, bbls.		
Ed. Dom Cryst.	.85	.72
Gambier lb.		
Common	.08	.07½
Plantation	.11	.10
Gums		
Aloes, Socotrine	.58	.42
Gamboge, Pipe	.95	.75
Powd.	1.05	.80
Sandarac	.52½	.50
Iodide, dms.		
Potassium	1.35	1.20
Mangrove Bark, ton	36.00	34.00
Nux Vomica, bbls.	.07	.05
Oil		
Cade	.55	nom.
Caraway	9.00	nom.7.75
Cassia	2.25	2.00
Cajeput, tech. dms.	.78	.65
Citronella		
Java, cns. dms.	.41	.38
Cananga		
Native	5.50	5.00
Rectified	6.00	5.50
Quicksilver	180.00	178.00
Tankage, unit		
Fertilizer	3.00	2.50
Feeding	3.25	2.85
Waxes		
Japan	.17½	.16½

DECLINED

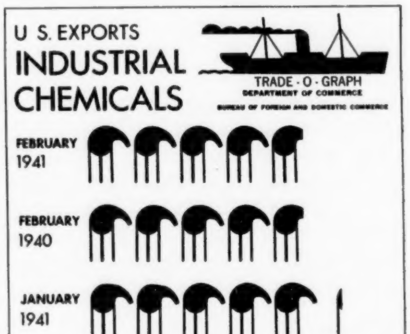
	April 30	Mar. 31
Ascorbic Acid, oz.	1.85	2.00
Bismuth		
Subcarbonate	1.59	1.73
Subgallate	1.49	1.77
Subnitrate	1.29	1.48
Thiamine hydrochloride,		
gm.	.65	.80
Valerian Root	.48	.75
Wormwood Herb	.90	1.00

This action was taken a few hours after President Roosevelt's orders for the creation of a shipping pool to supply adequate shipping facilities for strategic materials and vital commerce. Also announced was the fact that rubber freight rates to the Pacific Coast were cut \$4 per ton in a move to expedite rubber imports by shortening the ship routes from the Far East.

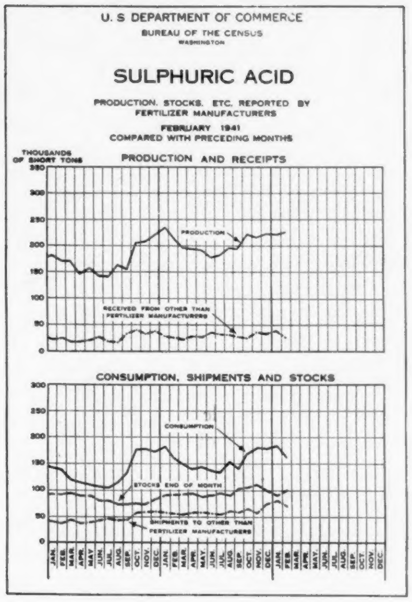
Other steps are in the offing before this situation is solved. A shortage of drying oils is getting attention right now and consideration is being given to imposing a priority setup and price-fixing for this group. A full-fledged system of priorities is seen ahead for the inland transportation industries as a consequence of the shift of millions of tons of freight from water carriers to the railroads and the tightening supplies of cars. And while on the subject, there will probably be a system of priorities set up on equipment soon which will include fertilizer materials and spraying compounds.

Shipping Highlights

Among the things that happened last month to the shipping industry were: a doubling of cargo war risk rates to and from Greece and the Turkish Mediterranean; replacement of many British merchant ships in the Near East by readjusting some trade routes of American ships; withdrawal of American tonnage to aid Britain which will probably cause a more severe shortage of tonnage than already exists; revocation of navicerts for shipments to Greece territory by Britain; settlement of strikes on certain steamers; and an announcement from the Netherlands Indies government that June priority for cargo space also will be extended to cargo with Pacific Coast destinations. In June, preference will be given to tin, tin ore, rubber and latex, and in second place to tapioca flour, fibers, gums, dammar and manganese ore. In third place priority will be given to coconut oil, palm oil, paraffin wax, citronella oil and several others.



Heavy Chemicals: Defense buying continues to place the heavy chemicals market under ship-as-fast-and-as-much-



as-you-can conditions. Supplies in the spot market are getting harder to find and premiums are being paid for many items. Among the shortages are nickel salts (need we explain why?), copper sulfate, ammonia and sodium silicofluoride (domestic output is practically all sold), chlorine, carbon tetrachloride and other chlorinated solvents, potassium permanganate, (all the potash derivatives are being affected by shortage of muriate potash, supposedly caused by labor trouble which has curtailed production), arsenic, anhydrous ammonia, and many others. Vast quantities of ammonia, plating materials and rubber accelerators are moving into defense efforts. The shortage of technical chloroform, reflected by the chlorine shortage, was a puzzler to this department. Calling up one trade insider who ought to know we asked, "what are they using all this chloroform for?" "Dunno," he said, "I think they're drugging us into war."

Stimulated domestic building has taken its share of heavy chemicals. Sodium silicofluoride, important to enamelware, has been cut off from us and our domestic output is all sold. Calcium chloride, also stimulated by construction of roads and other building, is moving steadily against contracts. Oxalic acid, important to organic synthesis activities which are increasing, is only available in small quantities, but it is understood that manufacturers are reserving quantities for certain industries where consumption has increased. Dye and plastic trades are finding it harder to get phthalic anhydride. Alkalies, of course, are moving with gusto into the very busy glass, paper textile, soap and you-know-what other industries. As reported last month, red amorphous phosphorous is advancing in the resale market, reflecting we suppose, conditions in the match industry (it's not poisonous) and in organic synthesis. Glacial acetic manufacturers are way behind schedule on deliveries. Chromic acid and sodium stannate look good from here. Summing it up, domestic consumption of industrial chemicals is at the highest levels in many years and the spot market is practically bare of offerings.

Fine Chemicals: So far, Leon Henderson's warning that the price of quicksilver is too high and that the skyrocketing of prices is unjustified, has not affected the metal which remained in the vicinity of $180 during the last month. Domestic production of mercury is increasing but there are practically no imports. Quinine shipments are expected by early June so watch the prices. (Surcharge is now 8½ cents an ounce instead of 7.) Citric acid, in heavy demand as a substitute for tartaric in soft drinks, has been taken for export, it is noted and resale prices are going in an upward direction. One large manufacturer sent out an official statement on citric acid, which had been jumping around quite a bit, reading as follows:

"It has come to our attention that some resale factors are advising the trade that, with the approach of summer and consequent heavier consumption of citric acid in the beverage industry, all consumers of the product may be faced with a market shortage. As large manufacturers of this acid we wish to declare emphatically that there is no justification for such misleading reports. We have ample supplies of raw material, have no intention of advancing our prices, and can see no reason why the manufacturers of this acid in the United States cannot take care of the legitimate requirements of this country."

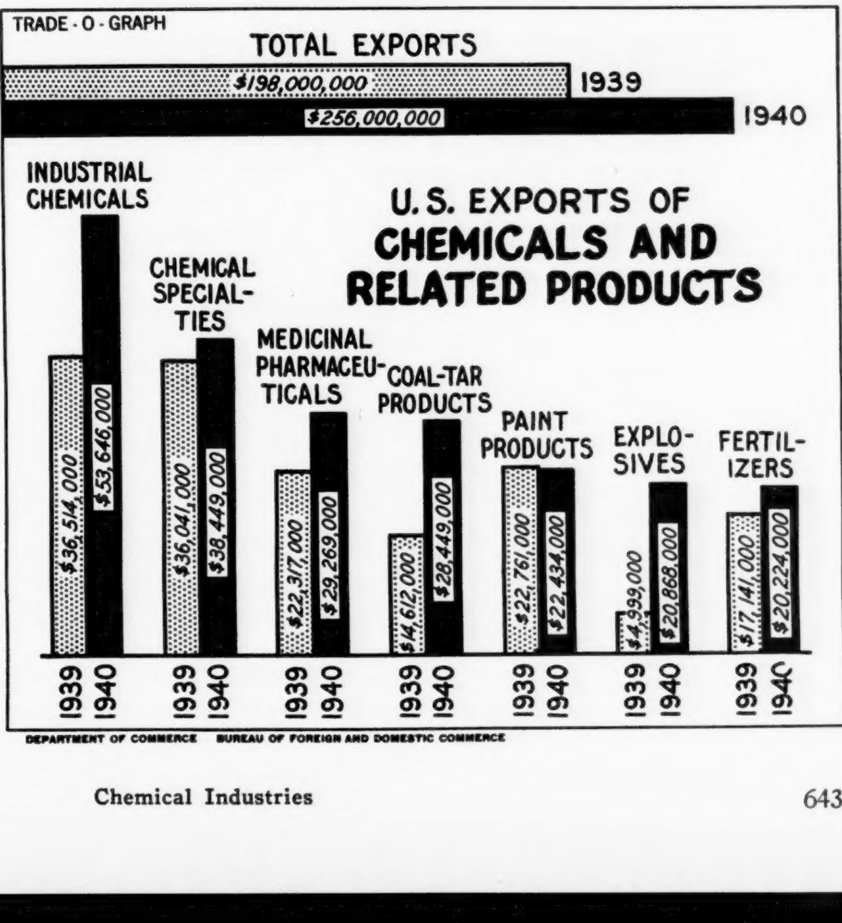
Tartrates, as last month, continued to grow scarcer and there was not much activity in this direction. Along with the rising price chemicals went resublimed iodine and potassium iodide, adjusted because of the higher cost of crude iodine. Brazil raised its prices on castor beans sending castor oil up.

All vitamin items, reflecting their increasing popularity, are in great demand and nicotinic acid, white bread's hypodermic, is scarce. Reason for the increase in codliver oil prices—Germans are sinking trawlers near Iceland. Formaldehyde and certain chemical solvents are in the premium market with manufacturers unable to supply any speculation. Narcotics, glycero phosphates and acetylsalicylic acid are busy little chemicals keeping up with the demand.

Bismuth Compounds Decline

Interesting because they declined instead of going up in price were: bismuth subcarbonate, subgallate and subnitrate, lower because of competitive conditions and ascorbic acid USP XI (Vitamin C) reduced 15 cents an ounce, reason unknown to this column but probably due to its production on a larger scale.

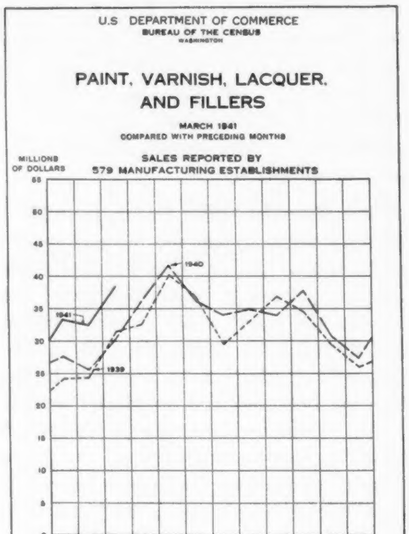
Coal Tar Chemicals: Coal tar products saw much activity last month and in many directions. Tar acids, phthalic anhydride, phenol were in great demand and the resumption of soft coal operations in the South helped relieve the pressure considerably. The coal tar industry's cresylics, challenged last month by the additional introduction of new material of petroleum origin, continued to supply



DEPARTMENT OF COMMERCE BUREAU OF FOREIGN AND DOMESTIC COMMERCE

in good quantities and the synthetic products, it is reported, had a similarly busy month.

Interesting was the presidential proclamation of April 15 placing on the export control list naphthalene, phenol, phthalic anhydride, aniline and nitro derivatives of benzene, toluene, xylene, naphthalene and phenol. Output and consumption of all these products, in the words of one dealer, "is terrific." Little toluol or xylol is offered for sale. Production of various intermediates is considered good. Typical of the demand to expect is the extent of activities in the textile, floor covering, paper and other consuming industries. There will be a particularly heavy demand for exports of dyestuffs, it is felt. Canada, South America and India will be customers. Somebody has reported that quantities of Swiss dyes are going to China by way of Lisbon.

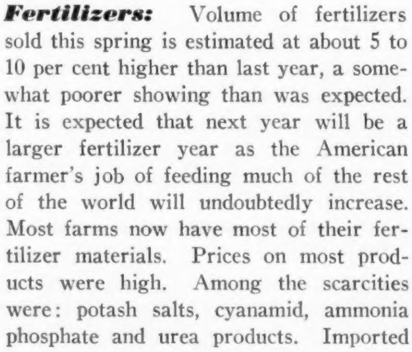


Paint Materials: March sales of paint, varnish, lacquer and fillers were second only to March, 1929. Governmentwise, the paint industry was the focus of considerable attention last month. One conference after another involved the paint industry—one to insure the defense program against delays due to shortages of essential paints, another to sum up the drying oils situation and make recommendations for the continuance of supplies. General licensing controls were placed on exports of casein on and after May 6 and the following paint materials were placed under the export control system when bound for Britain, British Dominions and republics of this hemisphere: cadmium pigments, chrome pigments, titanium pigments and zinc pigments.

Paint Industry Busy

The paint industry, in its busiest year in many, continued to buy large quantities of raw paint materials and the peak of business, expected around May 1 continued to be placed at a forward date. Pigments and colors were especially active. Shipments of varnish gums dropped off. Buying of carbon blacks was slow following the advance in prices April 1. Most consumers had bought well in advance of the rise. Synthetic and natural resins alike went into the hands of manufacturers in quantities the like of which have not been seen for quite some time. In the naval stores market there were advances in the gum turpentine spot prices at Savannah and one week, every grade of rosin showed declines on a 100-pound basis. Spot shellac prices remained in the nominal quotation class, unchanged. Arrivals are small and eagerly awaited as was noticeable upon the recent arrival from Calcutta of 1,348,900 pounds of all grades of shellac—most of it was sold before the ship docked. Domestic production of casein is considerably below normal and prices have gone up. Sales of dry and chemical colors are ahead of the current rate of production, which is high. Current shipments of lead oxides and other paint pigments are the highest in years. South American casein is not being offered in any quantity. Two of the largest producers are reputed to be sold out. China clay (kaolin) sales from domestic mines in 1940 set a new record.

Fertilizers: Volume of fertilizers sold this spring is estimated at about 5 to 10 per cent higher than last year, a somewhat poorer showing than was expected. It is expected that next year will be a larger fertilizer year as the American farmer's job of feeding much of the rest of the world will undoubtedly increase. Most farms now have most of their fertilizer materials. Prices on most products were high. Among the scarcities were: potash salts, cyanamid, ammonia phosphate and urea products. Imported blood and fertilizer and feed grade tankage at New York were up. Menhaden sales were made but at higher prices. So far the intended expansion of menhaden output in the Chesapeake has not been felt.



South America last month showed itself to be a good and growing source of nitrogenous material. Increased shipments are becoming noticeable of material we formerly got from Europe. Mixed fertilizer materials were in great demand on all types of farms, and favorable planting weather for an extended period contributed to increased sales. Nitrate of soda was sold in considerable amounts. Export licenses for sulfate of ammonia and high grade potash salts, it is evident, will be hard to obtain. This should leave sufficient supplies for domestic demands for some months to come. Incidentally, the top-dressing season which follows the regular fertilizing season should call for additional supplies in most parts of the country. Several new developments in this field, among them one calling for nitrogen-potash top-dressers, have been introduced which will bear watching.

Natural Raw Materials: No prospect appears for relieving the Far Eastern situation which explains the reason for raising prices in all products from that area. During the last month advanced prices were chalked up so often on Far Eastern materials it was hard to keep them tabulated. Increased rates were reported on coconut oil, copra and copra cake from the Philippines and there were reports that the government would take steps to assure ourselves of the market there. Gum arabic, myrobalans, wattle bark were among the products that showed increasing prices and scarcer supplies. Arrivals of carnauba wax during the first three months of this year were about 500 tons less than arrivals for the same period last year. Indicative of the topsy-turvy conditions in the carnauba market, in fact in most chemical markets is this little item; one dealer talked to the other day reported an inquiry from Brazil, no less, for a shipment of carnauba wax, pronto! Uricury wax and candellila, in greater demand, are being taken out of the market rapidly. Shipments are slow and uncertain. Japan wax was among the advances in prices during the month going to 17½c.

Chinawood Offerings Light

With chinawood oil imports at a low point (see page 645) many of the substitutes are finding increased activity. Dehydrated castor oil is being produced in larger quantities and incidentally at a higher price. Attention is being given to the other drying oils by this government and it is possible that a better understanding will come about with South America

in regard to increased trade. More oiticica oil, especially, it is felt, could come to this country from Brazil. Offerings of both imported and domestic fats and oils have not been much to brag about. Soybeans showed new high prices in the west and the increasing scarcity of olive oil was evident in both denatured and edible. In the sardine oil market it was rumored that fish may be paid for at a sliding scale this season which would probably send the price for fish to an all-time high. It was reported that in some parts of the lard, oleo, neatsfoot and acidless tallow oil market, none of these products can be offered until July.

Outlook: Here are the facts; make your own predictions this month: Domestic production will keep stepping up to meet the pace inflicted by defense activities. Supplies of raw materials in this country will be extracted to the utmost in order to feed the maw of the mighty industrial juggernaut we are building. Every effort will be made to get imports of raw materials into this country from every possible source, apparently even if it takes the whole darn navy to do it.

South American Relations

South American relations will get more of our attempts at what we call hemispheric cooperation and good-neighborliness. There's something lacking in our dealing with S. A., though: there are increasing reports that the Germans are once again growing in good favor down there. What it is, this department does not know. One thing that is needed, according to a rubber company man recently returned to this country, is a better system of dollar exchange between the nations. Apparently we want all the trade we can get but don't want to make it easy enough to do. There are also reports from people who have just returned that South America, our good neighbor, is buying plenty of stuff from this country which is being sold to Japan and in turn, to Germany. This doesn't sound much like hemisphere solidarity.

Chemical outputs in general are regarded as sufficient to take care of consuming requirements, notwithstanding anxiety for future supplies. Some chemicals are fully sold ahead and high prices are paid for spot stocks. Large consuming industries, however, are receiving regular monthly deliveries. There should be few instances where any allocation of stocks will be necessary.

Wall Street traders seem to be quite bearish on chemical issues because they contend that no group of common shares today should sell for 15 or 20 times earnings while other common issues are available at four to five times earnings. They also point to new and more costly wage demands upon industry. Our own prediction. . . . The labor cost factor is somewhat smaller than in most industries. The future of the industry has not even been scratched. Demand for plastics and other synthetics will grow and bring forth new industries for post-war expansion. We're bullish in every direction.

Chinawood Oil

Chinawood oil (also known as tung oil, chinese-wood oil or just plain wood oil) comes from the seeds of a tree indigenous to China and Japan. The Japanese product is a poor one. Next to linseed, chinawood has been our most important drying oil for the past 30 years. It also is being grown on a commercial scale in the Gulf Coast region of the U. S. Most of our supplies come from China, our own production being probably less than five per cent of our total consumption. Not a substitute for linseed, chinawood has distinctive characteristics which produce a tough and impervious film. It is especially good for certain ship paints and for waterproofing electrical wiring.

Being a Far Eastern product is what makes chinawood oil a problem today. There is no shortage of the nuts from which the oil is pressed in somewhat primitive fashion. Practically every farmer in China is in the business, small or large. As the Japanese have succeeded in closing one Chinese port after another, it has become necessary to ship the oil over the Burma Road to Rangoon from which port it is then sent to this country. Lately that hasn't been so easy to do. Ships are more scarce than ever and on top of that, tin, rubber and other more strategic materials are being given shipping priorities.

The Universal Trading Corporation of New York City has been largely responsible for getting large quantities of oil out of China and into this country during the past few years. It also has kept the market equitably supplied, has retired when "free" oil has been available from other sources and it has stabilized prices.

Briefly, here's how Universal works: In China, the government set up an agency, the Foo Shing Trading Corporation, sister organization of Universal in this country, to take over the problem of chinawood oil. Foo Shing's offices all over China are responsible for collecting and inspecting all oil available. While not all sources are yet under the control of this agency, it is the Chinese government's intention to make Foo Shing, working with Universal, the sole source of chinawood oil. Reason behind the control is probably the fact that the Chinese government is committed to send us her supplies as a means of payment for this government's recent loan to China.

Foo Shing Trading Corporation collects the oil much like milk companies collect milk from farmers in this country. China bought a great many of our 55-gallon gasoline drums for transportation and also bought a great many American trucks for the same purpose. Gradually, the Chinese hope to work out a system for shipping the oil in bulk which would facilitate handling, speed up deliveries and save money. After the oil is checked for quality (at this writing) it is transported over the Burma Road by truck to Lashio and from Lashio to Rangoon by rail. From that point on, it depends upon shipping facilities to reach this country. In the U. S., Universal sells to consumers through dealers. Complete information on sales is requested by the corporation as to the nature of the buyer's business, quantities, inventories, etc. Now it is supplying only urgent requests and is reported to be awaiting government instructions as to the quantities it will require for defense purposes.

Universal, it is estimated, now controls well over half of China's tung oil supplies. The results show that the situation has been handled admirably. There is still much "free" oil to be had in certain parts of China from dealers, if you can get it over here. Hankow and Hong Kong showed some activity in the "free" market recently. Here again, shipping problems and the Japanese must be considered. It has been reported that the Japanese have stopped all shipments of oil from Haiphong and Kwongchowwan. They have purchased considerable oil lately for military account.

In spite of all difficulties, close to 100,000,000 pounds of oil were imported in 1940. Consumption (with cooperation of users asked to help relieve the situation) was less than 60,000,000 pounds while stocks at the end of the year were reported as 57,000,000. On Dec. 31, 1939, stocks amounted to 31,000,000 pounds. So far this year defense activities have eaten into the stocks that were built up while imports have dropped tremendously. During the first two months of this year we received only a little more than 1,000,000 pounds, as compared with 23,000,000 pounds in the first two months of 1940. Oil from our own 1940 domestic crop is estimated to have been about 5,000,000 pounds.

(Continued on page 647)

The Industry's Bookshelf

Patent Fundamentals, by Leon H. Amdur, Chemical Publishing Co., 305 pages, $4.00. This book is directed to those with a minimum of knowledge of the "whys" "hows" and "whats" of patents. It gives most details found in other books and others not so readily found. It has been prepared in a clear, concise manner, and should prove particularly valuable to all those whose interest in patents is incidental to other activity. Chapter IV gives a step-by step description of the preparation and prosecution of an actual mechanical application and an actual design application by reproducing part of each action and amendment and other papers. It has been made so simple that the only danger is that the uninitiated might get a false impression of the work of the solicitor and try his hand at prosecuting his own cases under the misapprehension that "there's nothing to it." He might not recover from the shock! Chapter III gives details about classification of patents, and should interest librarians and others who make searches of the prior art. Plant patents are covered in a rather exhaustive manner in Chapter VIII. Patent solicitors could use reprints of Chapter IV to good advantage as "hand outs" for those clients and prospective clients who just can't or won't see or understand why their bright (at times) ideas are not patentable. It goes over the matter step by step, is fully illustrated, and quotes from and refers to past decisions in explaining each case.

A favorite pastime of patent solicitors is collecting "frivolous" patents. Chapter VII deals with these as well as with "utility" and "immorality." This little book will be found useful by practically everyone who has to do with patents. It is particularly free from errors of fact, although, among others, it gives the life of French patents as 15 years instead of 20. **E. L. Luaces.**

Printing and Litho Inks, third edition, by Herbert Jay Wolfe, MacNair-Dorland, New York, N. Y. 423 pages. Although there are a great many books on the art of printing there have been very few on the subject of printing inks. This may be due in some respects to the atmosphere and secrecy that surrounded their manufacture and formulation. However, since the chemist has taken his place in printing ink manufacture much of the mystery has been dispelled and the subject put on a scientific basis.

In this third edition the author brings more light on the subject. The general outline of the previous editions are followed with more complete and up-to-date information. The first chapter gives a brief history of the art of printing ink manufacture to show the progress that has been made in the industry and to create a background for a discussion of modern methods and materials. From this chapter on the scope of the book may be realized by the following list of chapters: General Characteristics of Inks, Printing Ink Vehicles, Solvents for Inks, Pigments, Natural Mineral Pigments, Manufactured Mineral Pigments, Organic Pigments, Black Pigments, Resins, Driers and Drying, Ink Compounds, Addition Agents, Typographic Printing Inks, Planographic Inks, Intaglio Printing Inks, New Types of Printing Inks, Special Inks, Factory Equipment, Testing.

Personalities in Chemistry

(*Continued from page 581*)

him over fifty years ago. Knight was born on a Kansas farm, being the son of a Pony Express rider. After fighting a losing battle with crop failures and debt his parents moved to the State of Washington where they began farm life anew. "Nowadays," he says "a place like ours would be called a subsistence farm, but we didn't have a five-dollar word for it then. We were just poor folks." The family had scarcely built its new home when Henry's mother died. One of her last words to Henry was a prayer that he would get an education and "be somebody"—a resolution concerning which he has never wavered.

At seventeen Knight was a country school teacher, at $35 a month, but they liked him so well his salary was later raised to $37.50. At 19 with his savings—$115 in gold—packed in the bottom of his valise, he sallied forth to the University of Washington, where, supplementing his cash by various chores including the job of custodian of chemical supplies, he received both bachelor and master's degrees. At the completion of his freshman year he obtained a bicycle, and pedalled 300 miles over rough roads back into the gold rush country, where his father was working a claim. For this he was rewarded by being made camp cook for the summer. After availing himself of a scholarship at the University of Chicago, Knight returned to his alma mater as a teacher of chemistry. From there he went to Wyoming as director of the State experiment station and dean of the College of Agriculture. While at Wyoming he found that to get ahead in his profession he needed a doctorate degree, so he called time out, went to the University of Illinois and got it. "It's my union card," he says, "It entitles me to work at my trade."

From Wyoming Knight went to Stillwater, Oklahoma, as dean of the College of Agriculture and director of the experiment station. Later, after a period as Honorary Fellow at Cornell, he was Dean and Director at West Virginia. In 1927 he was appointed to his present position in the Federal service.

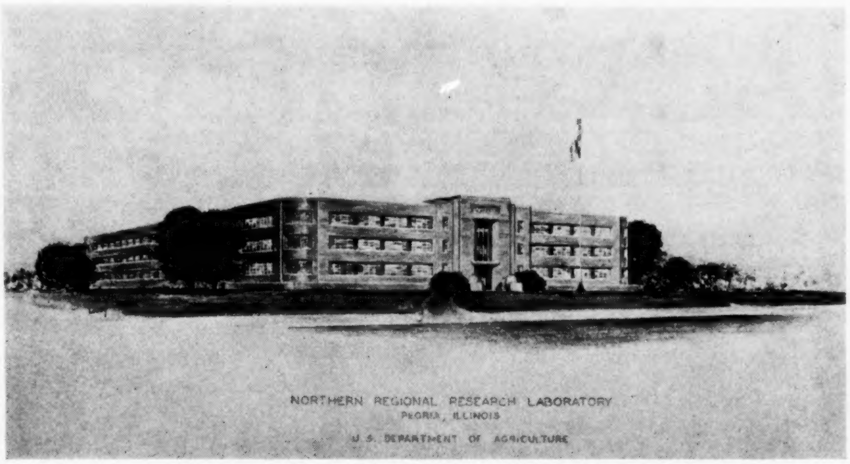
Knight is especially noted as a water chemist and for his pioneer work in ferreting out food adulterants. The first interest was born before his graduation from Washington, for even as an underclassman he had made a survey of potable waters of the State of Washington.

It was Dr. Knight who suggested in 1931 that selenium poisoning might be the cause of the "alkali diseases" that were resulting in heavy losses of livestock on the Great Plains. His suggestion led to research which has resulted in great savings to livestock producers in the seleniferous areas of the West. His interest in pure foods is a long story in itself, but it is sufficient to say that three years before enactment of the Federal Pure Food and Drug Act of 1906 through his efforts and public demonstrations of food adulteration at the State Fair, Knight had persuaded the State of Wyoming to legislate on the subject.

Despite Knight's manifold administrative duties, he has found time to record many of his technological findings in the form of various published monographs on qualitative analysis; research work on potable waters, effect of alkali upon seeds, food adulterations, Wyoming forage plants, soil nitrogen, wool, poisonous plants, effect of alkali upon cement drainage experiments, digestion experiments, soil acidity, etc.

Though Knight has been honored by membership in many scholastic fraternities and technical organizations he probably reveres no honor bestowed upon him more highly than being selected (1939) by his alma mater as "Alumnus Summa Laude Dignatus." Knight was the second alumnus ever thus honored by the University of Washington.

Knight possesses to an uncanny degree the administrative qualities requisite to direction of the world's largest research organization. He retains the respect and allegiance of his huge staff to a degree difficult to put into words. This mild-mannered man finds relaxation in manifold interests—boating, fishing, all sports, and even cooking, for his extensive experience in food chemistry and camp life has qualified him as a chef. He is a photographer of no mean ability; and being an enthusiastic motorist, he rarely avails himself of the services of a chauffeur.



Above the new regional research laboratory at Peoria, Ill.

Doriot Re-Elected

(*Continued from page 640*)

G. F. Doriot was re-elected president of the corporation at the same meeting and three new vice-presidents were chosen.

New vice-presidents are: E. D. Murphy, general sales manager; S. Carle Cooling, directing manager of sanitary can sales; A. G. Hopkins, in charge of manufacturing and engineering.

Chinawood Oil

(*Continued from page 645*)

What will happen is anybody's guess. There are various substitutes for chinawood and new formulations now being used—soybean, dehydrated castor, oiticica, perilla, fish oils and certain synthetic resins—but it is generally known that they cannot replace entirely chinawood's special qualities. Our procedure seems to be to conserve supplies by making substitutes wherever possible, encourage greater domestic production and hope for the day when a synthetic with the right number of unsaturated compounds makes its appearance on the market or an army with the right number of men stops the war.

It is rather difficult to make any predictions for future supplies of chinawood oil coming into this country. Supplies are plentiful, the only problem is to get them over here. The following table of prices gives an interesting picture of what has happened in the market over the past few years. Bear in mind the sequence of current events in China and in the world.

Chinawood Oil, Tks., Spot, N. Y. Prices

	High	Low
1941	$0.285	$0.2625
1940	0.270	0.2150
1939	0.270	0.1450
1938	0.155	0.0950
1937	0.230	0.1180
1936	0.190	0.1250
1935	0.400	0.0880

It is the consensus of opinion of dealers talked to by this department that, all in all, Universal Trading Corporation's activities in the chinawood oil market have been for the best. It hasn't exactly been Santa Claus for the middlemen though, who might have done better otherwise.

(*Continued from page 615*)
seal and dust caps, and the Government-approved type with raised eyelets to allow sealing.

Lewis Shepard Truck for Handling Carboys

Lewis Shepard Sales Corporation is marketing a safe truck for handling carboys as illustrated here. It is not necessary to tip the carboy to get the lip of the truck under the bottom of the container, for the carrying arms hold the box under the carrying cleats and are actuated into carrying position by a foot pedal. In

case of splashing, leaking or bottle breaking, the workman is at all times at a safe distance from the carboy.

Photograph shows a truck which can handle boxes from 17¼" to 20¼" in width. Twelve- and thirteen-gallon carboys of all types can be handled in this range of widths.

Trucks are equipped with semi-steel wheels 10" x 2¼", rubber-tired wheels 10" x 3" or celoron wheels. Eighteen-inch diameter wheels placed outside of the frame are also available. Wheels are all of the roller bearing type.

Propose Methods of Conserving Tin Supplies

Plans of tin can makers to conserve tin supplies for national defense were revealed by Ferris White, vice president of the Can Manufacturers Institute, last month. More than 15 per cent of the tin now used, he said, can be saved without discriminating against any single group of can users.

Mr. White explained that reducing the weight of the tin coating by 10 per cent and switching from tin plate to other types of coated steel in many cases could bring about the saving. He pointed out that a saving of 7,500 tons of tin annually, based upon present consumption, would be about one-tenth of all tin used in this country each year.

There is no emergency in tin at present, Mr. White said. Present tin stocks in the U. S. are sufficient for about 14 months consumption and current imports are sufficient to meet current requirements.

Steel Barrel Statistics

Monthly statistics on production, shipments, stocks, and unfilled orders of steel barrels (except beer barrels) and drums of heavy and light types were released last month by Acting Director Vergil D. Reed, Bureau of the Census, Department of Commerce.

The data in Table 1 for steel barrels and drums of *heavy types* were reported by 32 manufacturers, operating 42 plants, in 1941 and 1940, and by 34 manufacturers operating 44 plants in 1939. Production of steel barrels and drums of heavy types for February 1941 amounted to 1,034,681 as compared with 1,454,298 for January 1941, 802,960 for February 1940, and 597,953 for February 1939.

The data in Table 2 for steel barrels and drums of light types were compiled from reports of 16 manufacturers for 1941, 1940, and 1939. In this group 13 manufacturers also produced heavy types, data for which are included in Table 1.

The manufacturers whose data are included in these statistics (Tables 1 and 2) produced approximately 92 per cent of the total value of the output of the industry as reported at the Census of Manufacturers for 1939.

TABLE 1

Heavy Types (Number of Barrels and Drums)[1]

Year and month	Production	Shipments	Stocks, end of month	Unfilled orders, end of month Total
1941				
January	1,454,298	1,443,945	62,771	369,172
February	1,034,681	1,045,853	51,599	276,013
Total (2 mos.)	2,488,979	2,489,798	.....	......
1940				
January	1,137,543	1,158,345	41,708	450,032
February	802,960	808,635	36,033	335,183
Total (2 mos.)	1,940,503	1,966,980	.....	......
Total (year)	13,546,351	13,556,443	.....	......
1939				
January	785,591	781,031	36,717	438,746
February	597,953	600,411	34,008	421,037
Total (2 mos.)	1,383,544	1,381,442	.....	......
Total (year)	12,188,005	12,158,445	.....	......

TABLE 2

Light Types (Number of Barrels and Drums)[2]

Year and month	Production			Shipments			Stocks, end of month	Unfilled orders, end of month
	Total	Welded side seam	Lock side seam	Total	Welded side seam	Lock side seam		
1941								
January	256,465	69,111	187,354	255,824	69,596	186,228	34,384	60,164
February	239,613	74,320	165,293	238,330	73,407	164,923	35,667	58,736
Total (2 mos.)	496,078	143,431	352,647	494,154	143,003	351,151	.....	......
1940								
January	248,221	75,951	172,270	246,520	73,191	173,329	40,446	143,286
February	204,398	52,643	151,755	201,514	50,669	150,845	43,330	98,595
Total (2 mos.)	452,619	128,594	324,025	448,034	123,860	324,174	.....	......
Total (year)	2,803,531	835,659	1,967,872	2,805,284	836,500	1,968,784	.....	......
1939								
January	169,699	48,837	120,862	170,122	47,585	122,537	8,088	101,822
February	151,753	37,934	113,819	155,403	40,090	115,313	4,438	83,661
Total (2 mos.)	321,452	86,771	234,681	325,525	87,675	237,850	.....	......
Total (year)	2,622,363	868,229	1,754,134	2,592,129	862,328	1,729,801	.....	......

[1] Steel barrels and drums (except beer barrels) of 19-gauge or *heavier* steel, and steel barrels and drums made wholly or partly of 20-gauge, when of other than open-head construction; also grease drums of 100 lbs. capacity when made of 20-gauge or *heavier* steel.

[2] Steel barrels and drums (except beer barrels) of steel *lighter* than 19-gauge, excepting steel barrels or drums made wholly or partly of 20-gauge, when of other than open-head construction; also grease drums of 100 lbs. capacity when made of steel *lighter* than 20-gauge.

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.*

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - Mar. 1941 $1.12

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	...	.11
Acetaldol, 95%, 55 gal drs wks lb.	.11	.12	.11	.12	.11	.25
Acetamide, tech, lcl, kgs lb.	.28	.30	.28	.30	.28	.50
Acetanilid, tech, 150 lb bbls lb.	.31	.36	.29	.31	.27	.31
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11½	.10½	.11½	.10½	.11½
Acetin, tech, drs lb.	...	.33	...	.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.06	...	.06	.05	.06
drs, c-l, f.o.b. wks, frt all'd lb.	...	.07½	...	.07½	.06½	.07½
Acetyl chloride, 100-lb cbys lb	.55	.68	.55	.68	.55	.68
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.23	...	2.23	...	2.23
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	...	7.62
glacial, USP bbls, c-l, wks 100 lbs.	...	10.25	...	10.25	...	10.25
Acetic Acid Glacial, *Synthetic* 99.5%, cbys, cases, delv lb.	...	.0843	.0843	.0918	...	...
99.5%, 110-gal dr, delv lb.	.0843	.0868	.0843	.0868	...	...
USP XI, cases, cbys, delv lb.	.1025	.11	.1025	.11	...	...
USP XI, 110-gal drs, delv lb.	.10¼	.11	.10¼	.11	...	...
CP, cases, cbys, delv lb.	.13½	.14	.13½	.14	...	...
CP, 55-gal drs, delv lb.	.13¼	.13½	.13¼	.13½	...	...
Acetylsalicylic, USP, 225 lb. bbls lb.	...	.45	...	.45	...	.45
Adipic, kgs, bbls lb.	...	.31	...	.31	.31	.72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls lb.	...	.75	...	.75	...	.75
Ascorbic, bot oz.	1.85	2.10	1.85	2.10	2.25	3.00
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bulk-bgs, delv ton *a*	93.50	96.00	93.50	96.00	...	96.00
Broenner's, bbls lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Caproic, normal, drs lb.	.25	.30	.25	.35	.35	.40
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs. wks lb.	.03½	...	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls. lb. *b*	.20	.21	.20	.21	.20	.21½
anhyd, gran bbls lb. *b*	...	.23	...	.23	...	.23
Cleve's, 250 lb bbls lb.	...	.65	...	.65	...	.57
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.68	.70	.68	.70	.68	.70
99%, straw, LB, drs, wks, frt equal gal.	.68	.70	.68	.70	.68	.75
resin grade, drs, wks, frt equal lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.09¾
Crotonic, bbls, delv lb.	.26	.50	.21	.50	.21	.50
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	.24	.28	.24	.28	.24	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls lb.	.90	.93	.90	.93	.75	.93
USP, bbls lb.	1.07	1.10	...	1.10	.92	.95
H, 225 lb bbls, wks lb.	...	.45	...	.45	...	.45
Hydriodic, USP 47% lb.	...	2.42	...	2.42	2.30	2.42
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.35	...	.35	...	.35	.44
Hydrochloric, see muriatic						
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.09	.09¼	.09	.09¼	.09	.09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¾	.02½	.03¾	.02½	.03¾
22%, light ref'd, bbls lb.	.03½	.04¾	.03½	.04¾	.03½	.04¾
44%, light, 500 lb bbls lb.	.06½	.07¼	.06½	.07¼	.06½	.07¾
44%, dark, 500 lb bbls lb.	.05½	.06¾	.05½	.06¾	.05½	.06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.11½
Lauric, drs lb.	.15	.15½	.15	.15½	.12	.14½
Laurent's, 250 lb bbls lb.	...	.45	...	.45	.45	.46
Maleic, powd, kgs lb.	...	.30	...	.30	.30	.40
Malic, powd, kgs lb.	...	.47	...	.47	...	.47
Mixed, tks, wks N unit	.05	.06	.05	.06	.05	.07¼
S unit	.0085	.009	.0085	.009	.008	.009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.15	.18
Monosulfonic, bbls lb.	...	1.50	...	1.50	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	...	1.50
tks, wks 100 lb.	...	1.05	...	1.05	1.00	1.05
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	...	1.75
tks, wks 100 lb.	...	1.15	...	1.15	1.10	1.15
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	...	2.25
tks, wks 100 lb.	...	1.65	...	1.65	1.60	1.65
CP, cbys lb.	.06½	.08	.06½	.08	.06½	.08
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	nom.	.10	nom.	nom.	.14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	...	.12	...	.12	.12	.14
50%, acid, c-l, drs, wks lb.	...	.12	...	.12	.06	.12
75%, acid, c-l, drs, wks lb.	...	.07½	...	.07½	...	.07½
Picric, kgs, wks lb.	...	.35	...	.35	.35	.40
Propionic, 98% wks, drs lb.	...	.25	...	.25	...	.25
80% lb.	...	.14	...	.14	.14	.20
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.15	...	1.20	1.05	1.20
cryst, USP lb.	1.70	2.25	1.70	2.25	1.55	2.25
Ricinoleic, bbls lb.	.32	.37	.32	.37	.27	.33
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.35	.40	.35	.40	.35	.40
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	...	.17	.17	.18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	.54	.56	.54	.56	.44	.56
Tartaric, USP, gran, powd, 300 lb bbls lb.	...	.63½	.46¼	.63½	.35¼	.46¼
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	no prices		no prices		no prices	
Albumen, light flake, 225 lb. bbls lb.	.55	.62	.55	.62	.55	.62
dark, bbls lb.	.13	.18	.13	.18	.13	.18
egg, edible lb.	.72	.75	.65	.75	.53	.65
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.111	...	.111	...	.111
c-l, drs, delv lb.	...	.121	...	.121	...	.121
lcl, drs, delv lb.	...	.131	...	.131	...	.131
Amyl, normal l-c-l drs Wyandotte, Mich. lb.	...	.25	...	.25	...	.25
secondary, tks, delv lb.						
drs, c-l, delv E of Rockies lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, l-c-l, drs, f.o.b., Wyandotte, frt all'd lb.	...	.09	...	.09	...	.09
Benzyl, cans lb.	...	.68	...	.68	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.09	...	.09	...	.09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.10	...	.10	...	.10
Butyl, secondary, tks, delv lb. *d*	...	.07¼	...	.07¼	...	.07¼
c-l, drs, delv lb. *d*	...	.08¼	...	.08¼	...	.08¼
Butyl, tert denat cl drs lb.	...	.12½	...	.12½	...	...
lcl drs lb.	...	.13	...	.13	...	...
tks lb.	...	.11½	...	.11½	...	...
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.33	2.95	2.33	2.95	2.00	2.50
Denatured, CD, 14, c-l drs, wks gal. *e*	.36½	.38½	.36½	.38½	.32½	.36½
tks, East, wks gal.	.30½	.32½	...	.26½	.25½	.26½
Western schedule, c-l, drs, wks gal. *e*	...	.40½	...	.40½	.34½	.37½
Denatured, SD, No. 1, tks,	...	.27	...	.28½	.23½	.24½

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher: *e* Anhydrous is 5c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices Current

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv ....lb. *f*	...	.09½	...	.09½	...	.12
tech, contract, drs, c-l, delv ....lb.	...	.09	...	.09	...	.11½
Ethyl, 190 proof, molasses, tks ....gal. *g*	...	5.96½	...	5.96½	5.93½	5.94½
c-l, drs ....gal. *g*	...	6.02½	...	...	5.92½	6.00½
c-l, bbls ....gal. *g*	...	6.03½	...	...	6.00½	6.01½
Furfuryl, tech, 500 lb drs lb.	.20	.25	.20	.25	.25	.35
Hexyl, secondary tks, delv lb.	...	.12	...	.12	...	.12
c-l, drs, delv ....lb.	...	.13	...	.13	...	.13
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ....lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs ..lb.	...	.079	...	.079	...	.079
c-l, drs ....lb.	...	.069	...	.069	...	.069
tks ....lb.	...	.069	...	.069	...	.069
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd ....lb.	...	.66½	...	.66½	...	.65
Ref'd 98%, drs, f.o.b. wks, frt all'd ....gal.	...	.65	...	.65	...	.65
Tech 91%, drs, above terms ....gal.	.35	.40	.35	.40	...	.33½
tks, same terms....gal.	...	.30	...	.30	...	.28½
Tech 98%, drs, above terms ....gal.	...	.44	...	.44	.36	.37½
tks, above terms...gal.	...	.37½	...	.37½	.31	.32½
Spec. Solvent, tks, wks gal.	...	.28	...	.28	.23½	.25½
Aldehyde ammonia, 100 gal drs ....lb.	.65	.70	.65	.70	.65	.82
Aldehyde Bisulfite, bbls, delv ....lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ....lb.	.11	.12	.11	.12	.11	.12
Alphanaphthol, crude, 300 lb. bbls ....lb.	...	52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ....lb.	...	.32	...	.32	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	...	3.75
delv NY, Phila ...100 lb.	...	3.75	...	3.75	...	3.75
Granular, c-l, bbls wks ....100 lb.	...	3.50	...	3.50	...	3.50
Powd, c-l, bbls, wks 100 lb.	...	3.90	...	3.90	...	3.90
Chrome, bbls ....100 lb.	no prices		no prices		6.50	6.75
Potash, lump, c-l, bbls, wks ....100 lb.	...	4.00	...	4.00	...	4.00
Granular, c-l, bbls, wks ....100 lb.	...	3.75	...	3.75	...	3.75
Powd, c-l, bbls, wks 100 lb.	...	4.15	...	4.15	...	4.15
Soda, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Aluminum metal, c-l, NY 100 lb.	17.00	18.00	17.00	18.00	18.00	20.00
Acetate, 20%, bbls ....lb.	.08	.09	.08	.09	.07½	.09
Basic powd, bbls, delv lb.	.35	.50	.35	.50	.35	.50
32% basic, bbls, delv lb.	.09½	.12	.09½	.12	...	...
Insoluble basic powder, bbls, delv ....lb.	.35	.40	.35	.40	...	...
Soluble normal pwdr lb.	...	.33	...	.33	...	...
Soluble basic powder lb.	...	.33	...	.33	...	...
Chloride anhyd 99% wks lb.	.08	12	.08	.12	.08	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ...lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ....lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb. bbls, delv ....lb.	.12½	.13	.12½	.13	.12½	.13½
heavy, bbls, wks ....lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs ....lb.	.17½	.20	.17½	.20	.16¾	.20
Palmitate, bbls ....lb.	.20½	.21½	.20½	.21½	.20½	.24½
Resinate, pp., bbls ....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ...lb.	.18	19	.18	.19	.19	.20
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.15	...	1.15	...	1.15
c-l, bbls, wks ....100 lb.	...	1.35	...	1.35	...	1.35
Sulfate, iron-free, c-l, bags, wks ....100 lb.	...	1.60	...	1.60	1.60	1.80
c-l, bbls, wks ....100 lb.	...	1.80	...	1.80	1.65	1.80
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
50 lb cyl ....lb.	...	.22	...	.22	...	.22
26°, 800 lb drs, delv ...lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 ..cont.	.04	.05¼ z	.04	.05¼ z	.04	.05¼
Ammonium Acetate, kgs ..lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ....100 lb.	.0564	.0614	.0564	.0614	...	.0564
Bifluoride, 300 lb bbls ..lb.	.14	.16½	.14	.16½	.14½	.16½
Carbonate, tech, 500 lb bbls ....lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.11
Chloride, White, 100 lb bbls, wks ....100 lb.	4.45	...	4.45	...	4.45	4.90
Gray, 250 lb bbls, wks ....100 lb.	5.50	5.75	5.50	5.75	5.50	6.25
Lump, 500 lb cks spot lb.	no prices		no prices		no prices	
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ....lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ....lb.	...	.12	...	.12	...	.12
Naphthenate, bbls ....lb.	...	.17	...	.17	...	.17
Nitrate, tech, bbls ....lb.	.0435	.0455	.0435	.0455	...	.0455
Oleate, drs ....lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ....lb.	.19	.25	.19	.25	.19	.25
Perchlorate, kgs ....lb.	no stocks		no stocks		no stocks	
Persulfate, 112 lb kgs ..lb.	.21	.22	.21	.22	.21	.22

f Prices are 1c higher in each case.
g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls ....lb.	.07¼	...	.07¼	.09¼	.07¼	.10
Ricinoleate, bbls ....lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls...lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ....lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	...	29.00
Sulfocyanide, pure, kgs ..lb.	...	.65	...	.65	...	.65
Amyl Acetate (from pentane) tks, delv ....lb.	...	.105	...	.105	...	.105
c-l, drs, delv ....lb.	...	.115	...	.115	...	.115
lcl, drs, delv ....lb.	...	.125	...	.125	...	.125
tech drs, delv ....lb.	...	.11½	.11½	.12	...	.12
Secondary, tks, delv ..lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	...	.09½
tks, delv ....lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks ib.	.56	.68	.56	.68	.56	.68
mixed, drs, wks ....lb.	.0565	.0665	.0565	.0665	.0535	.0665
tks, wks ....lb.	...	.0465	...	.0465	...	.0465
Mercaptan, drs, wks ...lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs....lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs ..lb.	...	.26	...	.26	...	.26
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ....lb.	...	.14½	...	.14½	...	.14½
Annatto fine ....lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% ....lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ....lb.	...	.65	...	.65	...	.65
Antimony metal slabs, ton lots ....lb.	.14	...	.14	.16½	...	.14
Butter of, see Chloride						
Chloride, soln, cbys ....lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ....lb.	...	.16	...	.16	.16	.22
Oxide, 500 lb bbls ....lb.	.12	.14½	.12	.14½	.13	.15¾
Salt, 63% to 65%, drs lb.	...	.28	...	.28	.28	nom.
Archil, conc, 600 lb bbls lb.	no prices		no prices		no prices	
Double, 600 lb bbls ....lb.	no prices		no prices		no prices	
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ....lb.	.09½	.10	.09½	.10	.09	.10
Arsenic, Metal ....lb.	no prices		no prices		...	...
Red, 224 lb cs kgs ....lb.	no prices		no prices		.17½	.18
White, 112 lb kgs ....lb.	.03½	04¼	.03½	.04¼	.03	.04¼
Barium Carbonate precip, 200 lb bgs, wks ton	45.00	50.00	45.00	50.00	45.00	62.50
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	...	43.00	...	43.00	43.00	47.00
Chlorate, 112 lb kgs, NY lb.	nom.	.45	...	.45	.20	.45
Chloride, 600 lb bbls, delv, zone 1 ....ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	.10	.12
Hydrate, 500 lb bbls ...lb.	.05½	.07	.05½	.07	.05½	.07
Nitrate, bbls ....lb.	.09½	.10½	.08½	.10½	.09½	.10½
Barytes, floated, 350 lb bbls c-l, wks ....ton	...	25.15	...	25.15	...	25.15
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ....ton	...	16.00	...	16.00	...	16.00
200 mesh ....ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ....lb.	.45	.50	.45	.50	.55	.60
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.14	...	.14	.14	.16
90% c-l, drs ....gal.	...	.19	...	.19	.19	.21
Ind pure, tks, frt all'd gal.	...	.14	..	.14	.14	.16
Benzidine Base, dry, 250 lb. bbls ....lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ....lb.	.19	.21	.19	.21	.19	.21
Beta-Naphthol, 250 lb bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	...	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.51	.52	.51	.52	.51	.52
Bismuth metal ....lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ....lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ....lb.	3.10	3.09	3.10	3.09	...	3.10
Subbenzoate, boxes ....lb.	...	3.40	...	3.40	3.25	3.36
Subcarbonate, kgs ....ib.	1.73	1.76	1.73	1.76	1.73	1.76
Subnitrate, fibre, drs ...lb.	1.20	1.51	1.20	1.51	1.48	1.51
Trioxide, powd, boxes ..lb.	...	3.65	...	3.65	3.56	3.57
Blanc Fixe, Pulp, 400 lb. bbls, wks ....ton *h*	35.00	42.50	35.00	42.50	50.00	80.00
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.00	2.85	2.00	2.85	...	2.85
lcl, drs, wks ....lb.	2.25	3.35	2.25	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	3.25	2.40	3.25	2.25	3.35
Chicago, high grade ..unit	...	3.50	2.50	3.50	2.00	3.50
Imported shipt ....unit	...	3.10	2.45	3.10	2.25	3.30
Blues, Bronze Chinese						
Prussian Soluble ....lb.	...	.33	...	.33	.33	.37
Milori, bbls ....lb.	.33	...	.33	.34	.33	.34
Ultramarine,* dry, wks, bbls ....lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	...	.16	...	.16	...	.16
Pulp, Cobalt grade ...lb.	.22	.24	.22	.24	.22	.27
Bone, 4½ + 50% raw, Chicago ....ton	...	34.00	30.00	34.00	30.00	33.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp ton		34.00	31.50	33.00	31.50	32.50
Domestic, bgs, Chicago ton	34.00	35.00	32.00	35.00	29.00	32.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

Prices Current

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Borax, tech, gran, 80 ton lots,						
sacks, delv ....ton i	...	43.00	...	43.00	...	43.00
bbls, delv ....ton i	...	53.00	...	53.00	...	53.00
Tech, powd, 80 ton lots,						
sacks ....ton	...	48.00	...	48.00	47.00	48.00
bbls, delv ....ton	...	58.00	...	58.00	57.00	58.00
Bordeaux Mixture, drs ...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.43
Bronze, Al, pwd, 300 lb drs lb.	...	.57	...	.57	...	.57
Gold, blk ....lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3						
tks ....lb.	.02½	.03	.02½	.03	.02¼	.03¾
Butyl, acetate, norm drs, frt						
all'd ....lb.	...	.10	...	.10	...	.10
tks, frt all'd ....lb	...	.09	...	.09	...	.09
Secondary, tks, frt all'd lb.	...	.07¼	...	.07¼	...	.07¼
drs, frt all'd ....lb.	.08¼	.08¾	.08¼	.08¾	.07½	.08
Aldehyde, 50 gal drs,						
wks ....lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Crotonate, norm, 55 and						
110 gal drs, delv .....lb.	...	.35	...	.35	...	.35
Lactate ....lb.	...	.23½	...	.23½	.23½	.24½
Oleate, drs, frt all'd ...lb.	...	.25	...	.25	...	.25
Propionate, drs ....lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv ....lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs ....lb.	...	.28½	...	.28½	...	.28½
Tartrate, drs ....lb.	no prices		.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	.	.35½
Cadmium Metal ....lb.	...	.90	.80	.90	.80	.85
Sulfide, orange, boxes ..lb.	...	1.10	...	1.10	.75	.85
Calcium, Acetate, 150 lb bgs						
c-l, delv ....100 lb.	...	1.90	...	1.90	...	1.90
Arsenate, c-l, E of Rockies,						
dealers, drs ....lb.	.06	.06½	.06	.06½	.06	.07¼
Carbide, drs ....lb.	...	.04¾	...	.04¾	.05	.06
Carbonate, tech, 100 lb bgs,						
c-l ....ton	16.00	20.00	16.00	20.00	...	...
Chloride, flake, 375 lb drs,						
burlap bgs, c-l, delv..ton	...	20.50	...	20.50	...	22.00
paper bags, c-l, delv..ton	20.50	35.00	20.50	35.00	20.50	36.00
Solid, 650 lb drs, c-l,						
delv ....ton	19.00	33.00	19.00	33.00	19.00	35.00
Ferrocyanide, 350 lb bbls						
wks ....lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb						
bbls ....lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25						
bbl lots, wks ....lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags ...ton	no prices		no prices		28.00	29.00
Palmitate, bbls ....lb.	.22	.24	.22	.24	.22	.24
Phosphate, tribasic, tech,						
450 lb bbls ....lb.	.0635	.0705	.0635	.0705	.0635	.07½
Resinate, precip, bbls ..lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.20½	.22½	.20½	.22½	.20½	.22½
Camphor, slabs ....lb.	.73	.74	.73	.83	.82	.84
Powder ....lb.	.73	.74	.74	.83	.82	.84
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b.						
plants ....lb.	...	.03325	...	.03325	.02¾	.03¾
lcl, bgs, f.o.b. whse ..lb.	...	.07025	...	.07025	...	.06525
Decolorizing, drs, c-l ..lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110						
gal drs, c-l, delv ....lb.	...	.66½	..	.66½	...	.66½
Casein, Standard, Dom, grd lb.	.15	...	.11½	.15	.10	.14½
80-100 mesh, c-l bgs ...lb.	.13	.14	.12	.14	.11	.15
Castor Pomace, 5½ NH_3, c-l,						
bgs, wks ....ton	15.00	...	15.00	...	15.00	17.50
Imported, ship, bgs ....ton	no prices		no prices		...	20.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs ....lb.	...	.20	..	.20	...	.20
Cellulose, Acetate, frt all'd,						
50 lb kgs ....lb.	...	.30	...	.30	.30	.34
Triacetate, flake, frt						
all'd ....lb.	...	.30	...	.30	...	...
Chalk, dropped, 175 lb bbls lb.	...	.02¾	...	.02¾	.02¾	.03¾
Precip, heavy, 560 lb cks lb.	...	.03¼	...	.03¼	.02¾	.03¼
Light, 250 lb cks ......lb.	...	.03¼	...	.03¼	.03¼	.04
Charcoal, Hardwood, lump,						
blk, wks ....bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ..ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls,						
wks ....lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.01¾	...	.01¾	...	.01¾
25%, bbls, wks ....lb.	...	.02⅜	...	.02⅜	...	.02½
China Clay, c-l, blk mines ton	...	7.60	...	7.60	7.60	9.50
Imported, lump, blk ...ton	no prices		no prices		...	26.00
Chlorine, cyls, lcl, wks, contract ....lb.	...	.07¼	...	.07¼	.07½	.08½
cyls, c-l, contract ...lb j	...	.05¼	...	.05¼	...	.05¼
Liq. tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks,						
cont ....lb.	...	.019	...	.019	...	.019
Chloroacetophenone, tins,						
wks ....lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb.						
drs, lcl, wks ....lb.	.06	.08	.06	.08	.06	.08
Chloroform, tech, 1000 lb						
drs ....lb.	...	.20	...	.20	.20	.21
USP, 25 lb tins ....lb.	...	.30	...	.30	.30	.31
Chloropicrin, comml cyls ..lb.	...	.80	...	.80	...	.80
Chrome, Green, CP ......lb.	.21	.25	.21	.25	.21	.25
Yellow ....lb.	.13½	.14½	.13½	.14½	.13½	.14½
Chromium Acetate, 8%						
Chrome, bbls ....lb.	...	.05¾	...	.05¾	...	.05¾

j A delivered price; * Depends upon point of delivery.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Chromium (continued)						
Fluoride, powd, 400 lb						
bbl ....lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ....bbl.	7.50	7.75	7.50	7.75	7.50	8.00
Cobalt Acetate, bbls ......lb.	...	.80½	...	.80½	...	.80½
Carbonate tech, bbls ...lb.	...	1.58	...	1.58	1.38	1.60
Hydrate, bbls ....lb.	...	1.98	...	1.98	...	1.78
Linoleate, solid, bbls ...lb.	...	.33	...	.33	...	.33
paste, 6%, drs ......lb.	...	.31	...	.31	...	.31
Oxide, black, bgs ......lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls ...lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls .....lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs ....lb.	.38	.39	.38	.39	.38	.39
Copper, metal, electrol 100 lb.	12.00	12.50	12.00	12.50	11.00	12.00
Acetate, normal, bbls,						
dlvd ....lb.	...	.24	.22	.24	.22	.24
Carbonate, 52-54% 400 lb						
bbls ....lb.	...	.1650	...	.1650	.1570	.169
Chloride, 250 lb bbls ...lb.	...	.16	...	.16	.16	.18
Cyanide, 100 lb drs ....lb.	...	.34	...	.34	...	.34
Oleate, precip, bbls ....lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	.18½	.20	.18	.20	.18	.18¾
red 100 lb bbls ......lb.	.19	.21	.19	.21	.19½	.20½
Sub-acetate verdigris,						
400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	...	4.75	...	4.75	4.45	4.75
Copperas crys and sugar bulk						
c-l, wks ....ton	...	17.00	14.00	17.00	14.00	20.00
Corn Sugar, tanners, bbls 100 lb.	...	4.05	3.36	4.05	2.99	3.39
Corn Syrup, 42°, bbls 100 lb.	...	3.52	3.42	3.52	3.02	3.47
43°, bbls ....100 lb.	...	3.57	3.47	3.57	3.07	3.52
Cotton, Soluble, wet 100 lb.						
bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran						
300 lb bbls ....lb.	...	.52½	.38¼	.52½	.28¼	.38¼
Creosote, USP 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks .....gal.	.13½	.14	.13½	.14	.13½	.14
Grade 2 ....gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs ....lb.	.09¾	.10¼	.09¾	.10¼	.09¾	.10¼
Crotonaldehyde, 97%, 55 and						
110 gal drs, wks .....lb.	...	.13	.11	.13	.11	.12
Cutch, Philippine, 100 lb. bale lb.	...	.04¾	...	.04¾	.04	.04½
Cyanamid, pulv, bags, c-l, frt						
all'd, nitrogen basis, unit	no prices		...	1.40	...	1.40
Derris root 5% rotenone,						
bbls ....lb.	.21	.23	.21	.23	.21	.30
Dextrin, corn, 140 lb bgs						
f.o.b., Chicago ...100 lb.	...	3.90	3.80	3.90	3.40	3.80
British Gum, bgs ...100 lb.	...	4.15	4.05	4.15	3.65	4.10
Potato, Yellow, 220 lb bgs lb.	...	.08	...	.08	...	.07¾
White, 220 lb bgs, lcl lb.	.08½	.09	.08½	.09	.08½	.09
Tapioca, 200 bgs, lcl ...lb.	...	.0715	...	.0715	...	.0715
White, 140 lb. bgs ..100 lb.	...	3.85	3.75	3.85	3.35	3.75
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	...	.47
lcl drs, wks ....lb.	...	.50	.48	.50	...	.50
Diamylene, drs, wks .....lb.	.095	.102	.095	.102	.095	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.085	.092
tks, wks ....lb.	...	.075	...	.075	...	.075
Diamylnaphthalene, l-c-l, drs,						
f.o.b. wks, ...lb.	...	.20	...	.20	...	...
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.21	.21½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate,						
drs, wks ....lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.53	...	.53	...	.53
c-l drs, wks ....lb.	...	.50	...	.50	...	.50
tks, wks ....lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	...	.25	...	.25	...	.25
Dibutylphthalate, drs, wks,						
frt all'd ....lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs lb.	...	.50	...	.50	...	.50
Dichlorethylene, drs .....lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal						
drs, wks ....lb.	.15	.16	.15	.16	.15	.16
tks, wks ....lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	...	.04	.025	.04	...	.025
tks, wks ....lb.	...	.025	.0221	.025	...	.0221
Diethanolamine, tks, wks..lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs,						
lcl, f.o.b., wks ....lb.	...	.70	...	.70	...	.70
Diethylamino Ethanol, l-c-l,						
drs, f.o.b. Wyandotte, frt						
all'd E. Miss. ....lb.	...	.75	...	.75	...	...
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	.40	.52
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs,						
wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs .....lb.	.14	.15½	.14	.15½	.14½	.15½
Mono ethyl ethers, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.16
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks ....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs,						
wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ....lb.	...	.16	...	.16	.16	.21
Oleate, bbls ....lb.	...	.17	...	.17	.13	.17
Stearate, bbls ....lb.	...	.22	...	.22	.22	.26
Dimethylamine, 400 lb drs,						
pure 25 & 40% sol						
100% basis ....lb.	1.00	1.05	1.00	1.05	1.00	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24

* These prices were on a delivered basis.

Prices

	Current Market		1941		1940	
			Low	High	Low	High
Dimethyl phthalate, drs, wks, frt all'd ... lb.	...	.18½	...	.18½	...	.18½
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	.18	.19
Dinitrochlorobenzene, 400 lb bbls ... lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls ... lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	22	..	.22	.22	.23
Dinitrotoluene, 300 lb bbls lb.	.	.15½	...	.15½	...	.15½
Diphenyl, bbls ... lb.	.15	...	.15	.20	.15	.20
Diphenylamine ... lb.	...	.25	...	.25	.25	.32
Diphenylguanidine, 100 lb drs ... lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	32.00	35.00	32.00	35.00	...	nom.
Extract ... lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
Egg Yolk, dom., 200 lb. cases lb.	.70	.75	.60	.75	.57	.62
Epsom Salt, tech, 300 lb bbls c-l, NY ... 100 lb.	...	1.90	...	1.90	1.90	2.10
USP, c-l, bbls ... 100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ... lb.	..	.26	..	.26	...	.26
Isopropyl 50 gal drs ... lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ... lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ... lb.	...	.73	...	.73	...	.68
Synthetic, wks, tks ... lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester						
tks, frt all'd ... lb.	...	.06½	...	.06½	.06	.06½
drs, frt all'd ... lb.	...	.07½	...	.07½	.07	.08½
99%, tks, frt all'd ... lb.	...	.06¾	...	.06¾	.06¼	.08
drs, frt all'd ... lb.	...	.07¾	...	.07¾	.07¼	.08¾
Acetoacetate, 110 gal drs lb.	...	.27½	...	.27½	..	.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs ... lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ... lb.	.45	.	.45	.50	.45	.50
Chloride, 200 lb drs ... lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ... lb.	...	.30	..	.30	.	.30
Crotonate, drs ... lb.		.35	..	.35		.35
Formate, drs, frt all'd ... lb.	.25	.26	.25	.26	.23	.24
Lactate, drs, wks ... lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks ... lb.	...	25	...	.25	...	.25
Oxybutyrate, 50 gal drs, wks ... lb.	1.00	nom.	1.00	nom.	.30	1.00
Silicate, drs, wks ... lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ... lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ... lb.	.75	.85	.75	.85	.75	.85
Anhydrous ... lb.	...	.75	...	.75	..	.75
Dichloride, 50 gal drs, E. Rockies ... lb.	.0693	.0746	.0693	.0746	.0595	.0694
Glycol, 50 gal drs, wks ... lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks ... lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks ... lb.	.16½	.17½	.16½	.17½	.16½	.21
tks, wks ... lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks ... lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ... lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks ... lb.	.11½	.12½	.11½	.12½	.11½	.13
tks, wks ... lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks ... lb.	.15½	.16½	.15½	.16½	.15½	.17
tks, wks ... lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl ... lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ... lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ... ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks ... ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls ... lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ... lb.	.06½	.07	.06½	.07	.06¼	.07
Fish Scrap, dried, unground wks ... unit *l*	4.35	...	...	...	3.10	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ... unit *m*	no prices		no prices		2.25	3.50
Fluorspar, 98% bgs ... ton	...	29.00	...	29.00	29.00	32.00
Formaldehyde, USP, 400 lb bbls, wks ... lb.	.055	.06	.055	.06	.05¾	.06¼
Fossil Flour ... lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	...	15.00	...	15.00	...	15.00
Imp powd, c-l, bgs ... ton	no prices		no prices		...	25.00
Furfural (tech) drs, wks lb.	...	.15	.10	.15	.10	.15
tks, wks ... lb.	...	.09	...	.09	...	...
Furfuramide (tech) 100 lb drs ... lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.17½	.16	.17½	.16	.17¼
Fustic, crystals, 100 lb boxes ... lb.	.24	.25	.24	.25	.24	.28
Liquid 50°, 600 lb bbls lb.	.10½	.14	.10½	.14	.10½	.14
Solid, 50 lb boxes ... lb.	.19	.21	.19	.21	.19	.21
G Salt paste, 360 lb bbls ... lb.	...	.45	...	.45	.45	.47
Gambier, com 200 lb bgs ... lb.	.07½	.08	.06½	.08	.06½	.07
Singapore cubes, 150 lb bgs ... 100 lb.	.10	.10½	.08¼	.10½	.08¼	.10
Glauber's Salt, tech, c-l, bgs, wks* ... 100 lb.	.95	1.18	.95	1.18	.95	1.18
Anhydrous, see Sodium Sulfate						
Glue, bone, com grades, c-l bgs ... lb.	.13½	.15	.13½	.15	.13½	.15½
Better grades, c-l, bgs lb.	.15	.23	.15	.23	.15	.23

l + 10; *m* + 50; * Bbls. are 20c higher.

Current

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Glycerin, CP, 550 lb drs lb.	...	.12½	...	.12½	...	.12½
Dynamite, 100 lb drs ... lb.	...	nom.	...	nom.	...	nom.
Saponification, drs ..... lb.	.09½	.10½	.09½	.10½	.09½	.13
Soap Lye, drs .... lb.	.07½	.07¾	.07⅛	.07¾	.07⅛	.08¼
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ... lb.	...	.27	...	.27	...	.27
Monostearate, bbls ..... lb.	...	.30	...	.30	...	.30
Oleate, bbls .... lb.	...	.22	...	.22	...	.22
Phthalate .... lb.	...	.38	...	.38	.37	.38
Glyceryl Stearate, bbls ... lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls .. lb.	...	.22	...	.22	...	.22
Phthalate, drs .... lb.	...	.38	...	.38	...	.38
Stearate, drs .... lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes ... lb.	.85	.90	.80	.95	.80	.90
Arabic, amber sorts .... lb.	...	.16	.14	.16	.08½	.15
White sorts, No. 1, bgs lb.	.35	.36	.35	.36	.28	.36
No. 2, bgs .... lb.	no prices		no prices		.27	.34
Powd, bbls .... lb.	.19	.21	.18	.21	.12½	.20
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY .... lb.	.04½	.05½	04½	.05½	.02½	.10½
California, f.o.b. NY, drs ton	29.00	36.50	29.00	36.50	29.00	36.50
Egyptian, 200 lb cases, f.o.b. NY .... lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases .... lb.	.23	.24	.19	.20	.17	.24
Copal, Congo, 112 lb bgs, clean, opaque .... lb.	...	.49½	...	.49½	...	.49½
Dark amber .... lb.	...	.12⅜	...	.12⅜	.11⅜	.12⅜
Light amber .... lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs						
Macassar pale bold .... lb.	...	.12¾	...	.12¾	.12¾	.15⅝
Chips .... lb.	...	.06¾	...	.06¾	.06¾	.09
Dust .... lb.	...	.05¼	...	.05¼	.04¾	.06¾
Nubs .... lb.	...	.10½	...	.10½	.10½	.14⅜
Singapore, Bold .... lb.	...	.15¾	...	.15¾	.14⅝	.17½
Chips .... lb.	...	.08½	...	.08½	.08½	.09⅛
Dust .... lb.	...	.05¼	...	.05¼	.04¾	.06¾
Nubs .... lb.	...	.11	...	.11	.11	.13½
Copal Manila, 180-190 lb	...	.13⅞	...	.13⅞	.13¾	.16¾
Loba B .... lb.	...	.11¾	...	.11¾	.11¾	.16⅛
Loba C .... lb.	...	.11¼	...	.11¼	.11¼	.14½
DBB .... lb.	...	.10	...	.10	.06⅞	.12⅛
MA sorts .... lb.	...	.07¾	...	.07¾	.07¾	.13¾
Copal Pontianak, 224 lb cases, bold genuine .. lb.	...	.15⅜	...	.15⅜	.15⅛	.18½
Chips .... lb.	...	.10	...	.10	.08⅜	.10½
Mixed .... lb.	...	.14⅜	...	.14⅜	.14⅛	.16⅝
Nubs .... lb.	...	.12¾	...	.12¾	.10¾	.13½
Split .... lb.	...	.13¾	...	.13¾	.13½	.16⅛
Damar Batavia, 136 lb cases						
A .... lb.	...	.21⅝	...	.21⅝	.21⅝	.22¾
B .... lb.	...	.20¼	...	.20¼	.20⅛	.21⅛
C .... lb.	...	.14⅝	...	.14⅝	.15⅝	.15¼
D .... lb.	...	.13¼	...	.13¼	.13¼	.13¾
A/D .... lb.	...	.15¼	...	.15¼	.13⅞	.14½
A/E .... lb.	...	.12⅞	...	.12⅞	.12⅞	.13⅜
E .... lb.	...	.10	...	.10	.10	.10⅜
F .... lb.	...	.08	...	.08	.08	.08¾
Singapore, No. 1 ...... lb.	...	.16⅝	...	.16⅝	.16⅝	.19⅝
No. 2 .... lb.	...	.12¼	...	.12¼	.12¼	.15¾
No. 3 .... lb.	...	.07⅛	...	.07⅛	.07⅛	.09
Chips .... lb.	...	.11	...	.11	.11	.12½
Dust .... lb.	...	.07⅛	...	.07⅛	.07⅛	.09
Seeds .... lb.	...	.09⅞	...	.09⅞	.09⅞	.10½
Elemi, cns, c-l .... lb.	...	.08½	...	.08½	.10⅛	.11⅝
Ester .... lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
Gamboge, pipe, cases ..... lb.	.95	1.00	.95	1.00	.70	.75
Powd, bbls .... lb.	1.05	1.10	1.05	1.10	.75	.80
Ghatti, sol, bgs .... lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ... lb.	.14	.33	.14	.33	.14	.33
Kauri, NY						
Brown XXX, cases .... lb.	...	.60	...	.60	...	.60
BX .... lb.	...	.38	...	.38	...	.38
B1 .... lb.	...	.28	...	.28	...	.28
B2 .... lb.	...	.24	...	.24	...	.24
B3 .... lb.	...	.18½	...	.18½	...	.18½
Pale XXX .... lb.	...	.61	...	.61	...	.61
No. 1 .... lb.	...	.41	...	.41	...	.41
No. 2 .... lb.	...	.24	...	.24	...	.24
No. 3 .... lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins .... lb.	no prices		no prices		2.00	4.50
Mastic .... lb.	1.50	1.60	1.50	1.60	.85	2.50
Sandarac, prime quality, 200 lb bgs & 300 lb cks .. lb.	.52½	.55	.50	.55	.35	.37
Senegal, picked bags ..... lb.	...	.30	...	.30	...	.30
Sorts .... lb.	...	.13	...	.13	...	.13
Thus, bbls .... 280 lbs.	15.00	15.25	15.00	15.25	15.00	15.25
Tragacanth, No. 1, cases .. lb.	2.75	2.85	2.75	3.10	2.65	3.50
No. 2 .... lb.	2.45	2.60	2.45	2.60	2.55	3.35
No. 3 .... lb.	2.10	2.20	2.10	2.20	2.45	2.90
Yacca, bgs .... lb.	.03½	.04	.03½	.04	.03½	.04
Hematine crystals, 400 lb bbls lb.	.20	.30	.20	.30	.20	.30
Hemlock, 25%, 600 lb bbls. wks .... lb.	...	.03⅛	...	.03⅛	.03⅛	.03⅜
tks .... lb.	...	.02¾	...	.02¾	.02¾	.03
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks .... gal.	...	.09¾	...	.09¾	...	.10½
Hexamethylenetetramine, powd, drs .... lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs .... lb.	.13	.13½	.13	.13½	.13	.13½
tks .... lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit	2.70	2.80	2.65	2.80	2.00	3.15
Hydrogen Peroxide, 100 vol, 140 lb cbys .... lb.	.16	.18½	.16	.18½	.16½	.20

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Hydroxylamine Hydrochloride ... lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	...	.14	...	.14		.14
Indigo, Bengal, bbls ... lb.	1.63	1.67	1.63	1.67	1.63	1.67
Synthetic, liquid ... lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars .. lb.	...	2.00	...	2.00	1.75	2.50
Irish Moss, ord, bales ... lb.	.25	.28	.25	.28	.15	.28
Bleached, prime, bales ... lb.	.32	.35	.32	.35	.28	.35
Iron Acetate Liq. 17°, bbls delv ... lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls .. 100 lb.	3.50	4.00	3.50	4.00	2.75	4.00
Isobutyl Carbinol (128-132° C)						
drs, frt all'd ... lb.	...	.23½	.22½	.23½	.22½	.34
tks, frt all'd ... lb.	...	.21½	...	.21½	.21½	.32
Isopropyl Acetate, tks, frt all'd ... lb.	...	.06½	...	.06½	.05½	.06½
drs, frt all'd ... lb.	.07½	.08	.07½	.08	.06½	.07½
Ether, see Ether, isopropyl.						
Keiselguhr, dom bags, c-l, Pacific Coast ... ton	22.00	25.00	22.00	25.00	22.00	35.00
Lead Acetate, f.o.b. NY, bbls,						
White, broken ... lb.	...	.11	...	.11	...	.11
cryst, bbls ... lb.	...	.11	...	.11	...	.11
gran bbls ... lb.	...	.11¾	...	.11¾	...	.11¾
powd, bbls ... lb.	...	.11¾	...	.11¾	...	.11¾
Arsenate, East, drs ... lb.	.09	.09½	.09	.09½	.08½	.11
Linoleate, solid, bbls ... lb.	...	.19	...	.19	...	.19
Metal, c-l, NY ... 100 lb.	...	5.70	...	5.70	4.90	5.70
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls ... lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv ... lb.	...	.08¾	.08	.08¾	.07½	.0815
97% Pb_3O_4, delv ... lb.	...	.086	.084	.086	.0765	.0848
98% Pb_3O_4, delv ... lb.	.0885	.0865	.0865	0885	.08	.0865
Resinate, precip, bbls ... lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls ... lb.	...	.25	...	.25	...	.26
Titanate, bbls, c-l, f.o.b. wks, frt all'd ... lb.	...	.10¼	...	.10¼	.10	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	.07	.07½
Basic sulfate, 500 lb bbls, wks ... lb.	...	.06½	...	.06½	.06¼	.06½
Lime, chemical quicklime, f.o.b. wks, bulk ... ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks ... ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	...	.07½	...	.07½	.07½	.11½
drs ... gal.	.10	.14	.10	.14	.11	.16
Linseed Meal, bgs ... ton	23.00	23.50	23.00	25.00	23.50	37.00
Litharge, coml, delv, bbls lb.	...	.0760	.07	.0760	.06½	.07½
Lithopone, dom, ordinary, delv, bgs ... lb.	...	.0385	...	.0385	...	.036
bbls ... lb.	...	.0410	...	.0410	.03¾	.03¾
Titanated, bgs ... lb.	...	.05¼	...	.05¼	...	.05¼
bbls ... lb.	...	.05½	...	.05½	...	.05½
Logwood, 51°, 600 lb bbls lb.	.10½	.12½	.10½	.12½	.10½	.12½
Solid, 50 lb boxes ... lb.	.16½	.20½	.16½	.20½	.16½	.20½
Madder, Dutch ... lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	67.00	75.00	65.00	75.00	58.00	70.00
Magnesium Carb, tech, 70 lb bgs, wks ... lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ... ton	...	32.00	...	32.00	32.00	42.00
Fluosilicate, crys, 400 lb bbls, wks ... lb.	.11	.11¼	.10	.11¼	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd ... lb.	...	.26	...	.26	.25	.30
Light bbls above basis lb.	...	.26	...	.26	.20	.26
USP Heavy, bbls, above basis ... lb.	...	.26	...	.26	.25	.30
Palmitate, bbls ... lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls ... lb.	.11	.11¼	.11	.11½	.11	.11½
Stearate, bbls ... lb.	.23	.26	.23	.26	.23	.27
Manganese, acetate, drs .. lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	16	.15	.16	.15	.16
Chloride, bbls ... lb.	...	.14	...	...	...	...
Dioxide, tech (peroxide), paper bgs, c-l ... ton	...	71.50	...	71.50	62.50	70.00
Hydrate, bbls ... lb.	...	.82	...	.82	...	.82
Linoleate, liq, drs ... lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls ... lb.	...	19	...	.19	...	.19
Resinate, fused, bbls ... lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs ... lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs ... lb.	.10½	.10¾	.10½	.10¾	.08	.09¾
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ... ton	36.00	nom.	34.00	36.00	30.00	39.50
Mannitol, pure cryst, cs, wks lb.	...	.85	.85	.90	.90	1.00
commercial grd, 250 lb bbls ... lb.	.35	.40	.35	.45	.38	.50
Marble Flour, blk ... ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride (Calomel) lb.	...	2.70	...	2.70	2.45	2.95
Mercury metal .. 76 lb. flasks	...	180.00	167.00	180.00	163.00	228.50
Mesityl Oxide, f.o.b. dest., tks ... lb.	...	.10½	.10½	.15	...	.15
drs, c-l ... lb.	...	.11½	.11½	.16	..	.16
drs, lcl ... lb.	...	.12	.12	.16½	...	.16½
Meta-nitro-aniline ... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ... lb.	1.05	1.10	1.05	1.10	1.05	1.40
Meta-phenylene diamine 300 lb bbls ... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ... lb.	...	.65	...	.65	.65	.67
Methanol, denat, grd, drs, c-l frt all'd ... gal.	...	.45	...	.45	...	.45
tks, frt all'd ... gal.	...	.40	...	.40	...	.40

Current

Methanol, Pure
Orthonitrochlorobenzene

	Current	Market	1941 Low	1941 High	1940 Low	1940 High
Methanol (continued):						
Pure, drs, c-l, frt all'd gal.	...	.35½	...	.35½	.35	.38
tks .... gal.	...	.30	...	.30	.30	.33
95%, tks .... gal.	...	.29	...	.29	.28	.31
97%, tks .... gal.	...	.30	...	.30	.29	.32
Methyl Acetate, tech tks, delv .... lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ...... lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ..... lb.	.10½	.11½	.10½	.11½	.10½	.11½
Acetone, frt all'd, drs gal. *p*	...	.37½	...	.37½	.41	.44
tks, frt all'd ...... gal. *p*	...	.32	...	.32	.35	.39
Synthetic, frt all'd, east of Rocky M., drs .... gal. *p*	...	.37½	...	.37½	.36	.44
tks, frt all'd ... gal.	...	.32	...	.32	.32	.36
West of Rocky M., frt all'd, drs ... gal *p*	...	.41½	...	.41½	.41½	.48
tks, frt all'd .. gal. *p*	...	.35	...	.35	.35	.45½
Anthraquinone .... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ...... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd .... lb.	...	.55	...	.55	.55	.70
less than 100 lbs. f.o.b. wks .... lb.	...	.60	...	.60	.60	.75
Chloride, 90 lb. cyl .... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.06	...	.06	.05½	.06
50 gal drs, frt all'd, c-l lb.	...	.07½	.07	.07½	.06½	.07½
Formate, drs, frt all'd .. lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd .. lb.	...	.80	...	.80	...	.80
Mica, dry grd, bgs, wks .. ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs .... lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks .... lb.	...	1.75	...	1.75	...	...
crude .... lb.	...	.15	...	.15	...	...
Monoamylamine, c-l, drs, wks lb.	...	.50	.50	.52	...	.52
lcl, drs, wks .... lb.	...	.53	...	.55	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks .... lb.	...	.20	...	.20	...	...
Monobutylamine, drs, c-l, wks .... lb.	...	.50	...	.50	...	.50
lcl, wks .... lb.	...	.40	...	.53	...	.53
tks, wks .... lb.	...	.48	...	.48	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ..... lb.	...	.35	.35	.65	...	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs .... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks .... lb.	...	.67	...	.67	...	.75
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J1 bgs .... ton	no prices		35.00	48.00	28.50	40.00
J2 bgs .... ton	no prices		28.00	39.00	23.00	34.00
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks .... gal.	...	.26	...	.26	.26	.27
drs, c-l .... gal.	...	.31	...	.31	.31	.32
Naphthalene, dom, crude bgs, wks .... lb. *q*	2.25	2.50	2.25	2.50	2.25	2.75
imported, cif, bgs .... lb.	no prices		no prices		...	3.00
Balls, flakes, pks ...... lb.	.06¼	.07¾	.06¼	.07¾	.06¼	.07¾
Balls, ref'd bbls, wks ... lb.	...	.07	...	.07	.06¾	.07
Flakes, re'd, bbls, wks lb.	...	.07	...	.07	.06¾	.07
Nickel Carbonate, bbls ... lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls .... lb.	.18	.20	.18	.20	.18	.20
Metal ingot .... lb.	.35	.36	.34	.36	.34	.35
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs .... lb.	...	.703	...	.703	...	.70
Nitre Cake, blk .... ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks .... lb.	.08	.09	.08	.09	.08	.10
tks .... lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		2.20	2.60
dom, Eastern wks .... unit	...	2.20	...	2.20	2.20	2.90
dom, Western wks .... unit	...	2.00	1.75	2.00	1.95	2.00
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs .... lb.	.26	.29	.26	.29	.28	.30
Oak Bark Extract, 25%, bbls lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03⅜
tks .... lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks .. lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY .... lb.	...	.11½	.11	.11½	.10½	.13½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks .... lb.	...	.15	...	.15	...	...
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	.70	.74
Orthochlorophenol, drs ... lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.16	.16½	.16	.16½	.16	.16½
Orthodichlorobenzene, 1000 lb drs .... lb.	.06	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks .... lb.	.15	.18	.15	.18	.15	.18

a Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Orthonitroparachlorphenol, tins ..... lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ..... lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks ..... lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl ..... lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.21	...	.21	...	.21
51° liquid ..... lb.	...	.10	...	.10	...	.10
Paraffin, rfd, 200 lb bgs						
122-127° M P ..... lb.	...	.057	...	.057	.02¼	.0675
128-132° M P ..... lb.	.057	.0595	.057	.0595	.057	.0705
133-137° M P ..... lb.	.06¼	.06½	.06¼	.06½	.06¼	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks .. lb.	.10	.11¼	.10	.11¼	.10	.11¼
Aminoacetanilid, 100 lb kgs ..... lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ..... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ..... lb.	...	.32	...	.32	...	.32
Dichlorobenzene 200 lb drs, wks ..... lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks lb.	.23	.24	.23	.24	.34	.35
Nitroacetanilid, 300 lb bbls ..... lb	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ..... lb.	...	.45	...	.45	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks ..... lb.	...	.15	...	.15	.15	.16
Nitro-orthotoluidine, 300 lb bbls ..... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	.35	.37
Nitrosodimethylaniline, 120 lb bbls ..... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Phenylenediamine, 350 lb bbls ..... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls ..... lb.	...	.70	...	.70	.70	.75
tks, wks ..... lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ..... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ..... lb.	...	.48	...	.48	.48	.50
Paris Green, dealers, drs lb.	.23	.25	.23	.25	.23	.26
Pentane, normal, 28-38° C, group, 3 tks ..... gal.	...	.08½	...	.08½	...	.08½
drs, group 3 ..... gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd ..... lb.	.08	.08½	.08	.08½	.08	.08¼
Petrolatum, dark amber, bbls ..... lb.	...	.03¼	.02¾	.03¼	.02¾	.05
White, lily, bbls ..... lb.	...	.04¾	...	.04¾	.04¾	.08½
White, snow, bbls ..... lb.	...	.05½	...	.05½	.05½	.09½
Petroleum Ether, 30-60°, group 3, tks ..... gal.	...	.13½	...	.13½	...	.13½
drs, group 3 ..... gal.	...	.14½	...	.14½	.14½	.25½

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks ,wks ..... gal.	.06¾	...	.06¾	.07	.06⅞	.07
East Coast, tks, wks gal.	.09½	...	.09	.10½	.09	.10½
Lacquer diluents, tks						
East Coast ..... gal.	...	.10	.09½	.10	.09½	.10
Group 3, tks ..... gal.	.06⅝	.07¾	.06¼	.07¾	.07⅜	.07⅞
Naphtha, V.M.P., East tks, wks ..... gal.	.09½	...	.09	.09½	.09½	.10
Group 3, tks, wks ... gal.	.06¾	...	.06	.07	.06⅜	.07⅞
Petroleum thinner, 43-47, East, tks, wks ..... gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks .. gal.	.06	.07	.05⅞	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks .. gal.	...	.09½	...	.09½	.09½	.10
Group 3, tks, wks .. gal.	.06	.07	.06	.07	.06⅜	.07⅞
Stoddard Solvents, East, tks, wks ..... gal.	.083	.09½	.083	.09½	.08¾	.09½
Group 3, wks ..... gal.	.05½	.06½	.05½	.06½	.06⅜	.06½
Phenol, 250-100 lb drs .... lb.	.12	.13¾	.12	.13¾	.12	.14¾
tks, wks ..... lb.	...	.11	...	.11	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs ..... lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ..... lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com ..... lb.	...	1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons ..... lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
70% basis ..... ton	...	2.15	...	2.15	1.85	1.90
72% basis ..... ton	...	2.50	...	2.50	2.15	2.35
Florida Pebble, 68% basis ton	...	1.90	...	1.90	1.90	2.85
75-74% basis ..... ton	...	2.90	...	2.90	2.90	3.85
Tennessee, 72% basis .. ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl ..... lb.	.15	.18	.15	.18	.15	.20
Red, 110 lb cases ..... lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .. lb.	.38	.42	.38	.42	.38	.44
Trichloride, cyl ..... lb.	.15	.16	.15	.16	.15	.18
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, ,100 lb drs, wks ..... lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ..... lb.	.50	.55	.50	.55	.53	.56
Steam dist wat wh bbls gal.	...	.59	...	.59	...	.59
tks ..... gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ... ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ..... ton	19.00	22.00	19.00	22.00	...	19.00

Current

Pitch, Burgundy
Rosins

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Pitch (continued)						
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.05½	06½
Imported .... lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .... bbl.	6.00	6.50	6.00	6.50	6.00	6.50
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks .... lb.	...	.30	...	.30	...	...
Potash, Caustic, wks, sol .. lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake .... lb.	...	.07	...	.07	.07	.07½
liquid, tks .... lb.	...	.02⅞	...	.02⅞	.02⅞	.03¾
Manure Salts, Dom 30% basis, blk ..... unit	...	.60	...	.60	.53½	.58½
Potassium Abietate, bbls .. lb.	...	.08	...	.08	.08	.09
Acetate, tech, bbls, delv lb.	...	.26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls .... lb.	...	.17	...	.17	...	.18
Bichromate Crystals, 725 lb cks* .... lb.	.09	.09¼	.08⅞	.09¼	.08¾	.09¼
Binoxalate, 30 lb bbls .. lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ... lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .... lb.	.06½	.06¾	.06½	.06¾	.06½	.07
liquid, tks .... lb.	...	.0275	...	.0275	.0275	.03
drs, wks .... lb.	.03	.03⅛	.03	.03⅛	.03	.03½
Chlorate crys, 112 lb kgs, wks .... lb.	nom.	.11	...	.11	.10½	.13
gran, kgs .... lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .... lb.	.09½	.10	.09½	.10	.10	.12½
Chloride, crys, bbls .... lb.	.08	nom.	.04	.08	.04	.04¾
Chromate, kgs .... lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs .... lb.		.55		.55	.55	.75
Iodide, 250 lb bbls ..... lb.	1.35	1.38	1.35	1.38	...	1.35
Metabisulfite, 300 lb bbls lb.	nom.	.21	nom.	.21	.13	.19
Muriate, bgs, dom, blk unit	...	.53½	...	.53½	...	.53½
Oxalate, bbls .... lb.	.28	.30	.25	.30	.25	.26
Perchlorate, kgs, wks .. lb.	.09½	.11	.09½	.11	.09½	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.19¼	.19¾	.19¼	.20½	.18½	.20½
Prussiate, red, bbls .... lb.	no prices		no prices		.38	.45
Yellow, bbls .... lb.	.16	.18	.16	.18	.15	.18
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	34.25	36.25
Titanium Oxalate, 200 lb bbls .... lb.	...	.40	...	.40	.40	.45
Pot & Mag Sulfate, 48% basis bgs .... ton	...	27.00	...	27.00	24.75	27.00
Propane, group 3, tks .... lb.	.03¾	.04	.03¾	.04	.03	.04⅜
Putty, com'l, tubs .... 100 lb.	...	3.15	...	3.15	...	6.00
Linseed Oil, kgs .... 100 lb.	...	5.00	...	5.00	...	4.50
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd .... gal.	4.75	4.95	4.75	4.95	4.75	7.50
3.6% pyrethrins, drs, frt all'd .... gal.	...	7.20	...	7.20	7.20	11.00
Flowers, coarse, Japan, bgs .... lb.	.23	.25	.23	.25	.23	.36
Fine powd, bbls ...... lb.	.25	.26	.25	.26	.25	.37
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	...	1.71
Refined, drs .... lb.	...	.48	...	.48	...	.51
Pyrites, Spanish cif Atlantic ports, blk .... unit	no prices		no prices		.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40
Quebracho, 35% liq tks .. lb.	...	.03¾	...	.03¾	.03¼	.03¾
450 lb bbls, c-l ...... lb.	...	.04¼	...	.04¼	.04	.04¼
Solid, 63%, 100 lb bales cif .... lb.	...	.04⅞	...	.04⅞	.04½	.04⅞
Clarified, 64% bales .. lb.	...	.05⅛	...	.05⅛	.04¾	.05⅛
Quercitron, 51 deg liq, 450 lb. bbls .... lb.	.08½	.09½	.08½	.09½	.08½	.09½
Solid, drs .... lb.	.11	.16½	.11	.16½	.10	.16½
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech, cans .... lb.	.68	.74	.68	.74	.75	.80
Rochelle Salt, cryst ...... lb.	.39½	...	.32½	.39½	.22¼	.29¾
Powd, bbls .... lb.	.38½	...	.31½	.38½	.21¾	.28¾
Rosin Oil, bbls, first run gal.	...	.40	.40	.50	...	.50
Second run .... gal.	...	.42	.42	.56	.52	.56
Third run, drs .... gal.	...	.46	.46	.57	.56	.57
Resins 600 lb bbls, 100 lb unit ex. yard NY:**						
B	...	2.06	2.06	2.13	1.80	2.45
D	...	2.26	2.08	2.36	1.87	2.48
E	...	2.31	2.07	2.36	1.95	2.51
F	...	2.34	2.08	2.37	2.10	2.51
G	...	2.35	2.18	2.38	2.10	2.48
H	...	2.35	2.27	2.38	2.10	2.48
I	...	2.35	2.26	2.39	2.10	2.54
K	...	2.36	2.36	2.65	2.12	2.75
M	...	2.38	2.38	2.65	2.20	2.81
N	...	2.47	2.47	2.81	2.39	2.85
WG	...	2.95	2.95	3.11	2.68	3.17
WW	...	3.25	3.25	3.31	3.00	3.40
X	...	3.25	3.25	3.31	...	...
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	1.56	1.31	1.56	1.15	1.80
D	...	1.65	1.51	1.65	1.22	1.83
E	...	1.67	1.60	1.67	1.30	1.86
F	...	1.67	1.62	1.67	1.45	1.86
G	...	1.67	1.62	1.67	1.45	1.83
H	...	1.68	1.63	1.68	1.45	1.83
I	...	1.71	...	1.71	1.45	1.89
K	...	1.90	1.84	1.90	1.47	2.10
M	...	2.01	2.01	2.10	1.55	2.16

* Spot price is ⅛c higher. ** Jan. 24, 1941, high and low based on 280 lb. unit.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Rosins (continued):						
N	...	2.47	...	2.47	1.70	2.20
WG	...	2.95	...	2.95	2.03	2.52
WW	...	3.25	...	3.25	2.25	2.75
X	...	3.25	...	3.25	2.35	2.75
Rosin, Wood, c-l, FF grade, NY	1.65	2.00	1.40	2.00	1.40	1.54
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ... lb.	no prices		no prices		...	.14
Powdered, bbls ... lb.	no prices		no prices		.08½	.10
Sago Flour, 150 lb bgs .. lb.	.04½	.05	.03½	.05	.04	.04½
Sal Soda, bbls wks ... 100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ... ton	...	17.00	...	17.00	...	17.00
Chrome, c-l, wks ... ton	...	16.00	...	16.00	11.00	16.00
Saltpetre, gran, 450-500 lb bbls ... lb.	...	.076	...	.076	.071	.08
Cryst, bbls ... lb.	...	.086	...	.086	.081	.08¾
Powd, bbls ... lb.	...	.086	...	.086	.081	.10
Satin, White, pulp, 550 lb bbls ... lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ... lb.	...	.46	...	.46	.46	.48
Shellac, Bone dry, bbls .. lb. s	.31	.32	.26	.32½	.23	.27
Garnet, bgs ... lb.	.25	.26	.20	.26	.18½	.23
Superfine, bgs ... lb. s	.25	.26	.16½	.26	.14½	.20½
T. N., bgs ... lb. s	.24½	.25½	.16	.25½	.13½	.19½
Silver Nitrate, vials ... oz.	...	.24	.24	.26⅞	.26¾	.27⅜
Slate Flour, bgs, wks ... ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ... 100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs ... 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk ... 100 lb.	...	.90	...	.90	...	.90
paper bgs ... 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls ... 100 lb.	...	1.35	1.35	1.45	1.35	1.45
Caustic, 76% grnd & flake, drs ... 100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs ... 100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks .. 100 lb.	...	2.00	...	2.00	1.95	1.97½

SODIUM

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Sodium Abietate, drs ... lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks ... lb.	.04	.04¼	.04	.05	.04	.05
90%, bbls, 275 lb delv lb.	.06	.06½	.06	.06¾	.06	.06¾
anhyd, drs, delv ... lb.	.08¼	.10	.08¼	.10	.08¼	.10
Alginate, drs ... lb.	.39	.70	.39	.70	.39	.96
Antimoniate, bbls ... lb.	.14	.14½	.14	.14½	.14½	.15
Arsenate, drs ... lb.	.07½	...	.07	.08¾	.07	.08¾
Arsenite, liq, drs ... gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks .. lb.	.06¼	.06¼	.06½	.09¼	.06½	.09½
Benzoate, USP kgs ... lb.	.46	.50	.46	.50	.46	.52
Bicarb, powd, 400 lb bbl, wks ... 100 lb.	...	1.70	...	1.70	1.70	1.85
Bichromate, 500 lb cks, wks* ... lb.	.06⅞	...	.06⅞	.07¼	.06¾	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.30	1.80
Chlorate, bgs, wks ... lb.	...	.06¼	...	.06¼	.06¼	.08½
Cyanide, 96-98%, 100 & 250 lb drs, wks ... lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv ... lb.	...	.09	...	.09	.08½	.09
Fluoride, white 90%, 300 lb bbls, wks ... lb.	.07	...	.07	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks ... lb.	.17	.18	.17	.18	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	...	2.80	2.80	3.05
Tech, reg cryst, 375 lb bbls, wks ... 100 lb.	2.45	...	2.45	...	2.45	2.80
Iodide, jars ... lb.	...	2.42	...	2.42	2.30	2.42
Metanilate, 150 lb bbls .. lb.	.41	nom.	.41	nom.	.41	.42
Metasilicate, gran, c-l, wks ... 100 lb.	...	2.35	...	2.35	...	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, cl, drs ... 100 lb.	...	3.75	...	3.75	3.75	3.75
wks, lcl, drs, .. 100 lb.	5.05	5.05	5.05	5.05	5.05	5.05
Monohydrated, bbls ... lb.	.023	.026	.023	.026	..	.023
Naphthenate, drs ... lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY ... ton	...	28.70	...	28.70	...	28.30
100 bgs, same basis .. ton	...	29.40	...	29.40	...	29.00
Bulk ... ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ... lb.	.06¾	...	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l ... lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb .. lb.	.14¾	...	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb .. lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.40	2.30	2.40	...	2.30
bgs, wks ... 100 lb.	...	2.20	2.10	2.20	...	2.10
Tri-sodium, tech, 325 lb bbls, wks ... 100 lb.	...	2.55	2.45	2.55	...	2.45
bgs, wks ... 100 lb.	...	2.35	2.25	2.35	...	2.25
Picramate, 160 lb kgs .. lb.	...	.65	...	.65	.65	.67
Prussiate, Yellow, 350 lb bbls, wks ... lb.	.10½	..	.10½	.10¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	...	.0510	.0510	.0515	...	.0530

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Sodium (continued):						
Sesquisilicate, drs, c-l, wks ... 100 lb.	...	2.90	...	2.90	2.00	2.90
Silicate, 60°, 55 gal drs, wks ... 100 lb.	no prices		1.40	1.80	1.40	1.80
40°, 55 gal drs, wks 100 lb	...	.80	...	.80	...	.80
tks, wks ... 100 lb.	no prices		...	.65	...	.65
Silicofluoride, 450 lb bbls NY ... lb.	.10	.12	.09¾	.12	...	...
Stannate, 100 lb drs ... lb.	.33½	.36½	.32½	.37	.31½	.35½
Stearate, bbls ... lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks ... 100 lb. t	1.45	1.65	1.45	1.65	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks ... lb.	.02¼	...	.02¼	.03	.02¼	.03
Solid, 650 lb drs, c-l, wks ... lb.	.03	...	.03	.03¾	.03	.03¾
Sulfite, powd, 400 lb bbls wks ... lb.	...	.05¼	...	.05¼	.023	.05¼
Sulfocyanide, drs ... lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls ... lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	
Sorbitol, com, solut, wks c-l, drs, wks ... lb.	...	.14¾	...	.14¾	.14¾	.16
Spruce, Extract, ord, tks .. lb.	...	.01⅛	...	.01⅛	...	.01⅛
Ordinary, bbls ... lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, tks .. lb.	...	.01⅜	...	.01⅜	...	.01⅜
Super spruce ext, bbls .. lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ... lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.00	2.90	3.00	2.50	2.95
Powd, 140 lb bgs ... 100 lb.	...	3.70	3.05	3.70	2.60	3.05
Potato, 200 lb bgs ... lb.	.05	...	.04½	.05½	.05	.07½
Imp, bgs ... lb.	no prices		no prices		...	.06½
Rice, 200 lb bbls ... lb.	.07½	.08½	.07½	.08½	.07¼	.08½
Sweet Potato, 240 lb bbls, f.o.b. plant ... 100 lb.	nom.	7.00	nom.	7.00	5.50	7.00
Wheat, thick, bgs ... lb.	...	.05	...	.05	.05¼	.05½
Strontium, carbonate, 600 lb bbls, wks ... lb.	no prices		no prices		.22	.23
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ... lb.	...	.45	...	.45	...	.45
tech, bbls, wks ... lb.	...	.40	...	.40	...	.40

SULFUR

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ... 100 lb.	1.40	1.95	1.40	1.95	1.40	2.35
bbls ... 100 lb.	1.95	2.50	1.95	2.50	1.95	2.70
Rubbermakers, bgs .. 100 lb.	...	2.00	...	2.00	2.00	2.80
bbls ... 100 lb.	...	2.35	...	2.35	2.35	3.15
Extra fine, bgs ... 100 lb.	...	2.35	...	2.35	2.85	3.00
Superfine, bgs ... 100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ... 100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ... 100 lb.	2.80	3.35	2.80	3.35	2.80	3.75
bbls ... 100 lb.	3.15	3.70	3.15	3.70	3.15	4.10
Roll, bgs ... 100 lb.	2.15	2.70	2.15	2.70	2.15	3.10
bbls ... 100 lb.	2.30	2.85	2.30	2.85	2.50	3.25
Sulfur Chloride, 700 lb drs, wks ... lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ... lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks ... lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks lb.	.16	.40	.16	.40	.16	.40
Mutiple units, wks ... lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride ... lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ... ton	no prices		no prices		98.00	140.00
Extract, 42°, bbls ... lb.	.06	.06¼	.06	.06¼	.06	.06¼
Superphosphate, 16% bulk, wks ... ton	...	8.50	...	8.50	8.50	9.00
Run of pile ... ton	...	8.00	...	8.00	8.00	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ... ton	...	.68	...	.68	.68	.70
Talc, Crude, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	15.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	14.00	17.25
French, 220 lb bgs, NY ton	no prices		no prices		23.00	35.00
Ref'd, white bgs, NY ton	no prices		no prices		45.00	60.00
Italian, 220 lb bgs to arr ton	no prices		no prices		64.00	70.00
Ref'd, white bgs,, NY ton	no prices		no prices		65.00	78.00
Tankage, Grd, NY ... unit u	...	3.10	2.35	3.10	2.35	3.25
Ungrd ... unit u	...	3.35	2.35	3.35	2.35	3.25
Fert grade, f.o.b. Chgo unit u	...	3.60	2.35	3.60	2.40	3.50
South American cif unit u	nom.	2.75	2.60	2.75	2.50	3.50
Tapioca Flour, high grade, bgs ... lb.	.04¼	.05½	.03	.05½	.02¾	.05
Tar Acid Oil, 15%, drs .. gal.	.22	.24	.22	.24	.22	.24
25% drs ... gal.	.25	.27	.25	.27	.25	.28
Tar, pine, delv, drs ... gal.	.26	.27	.26	.27	.26	.27
tks, delv, E. cities ... gal.	...	.21	...	.21	...	.21
Tartar Emetic, tech, bbls lb.	...	.44¾	.36¾	.44¾	.34¾	.36¾
USP, bbls ... lb.	...	.50	.42	.50	.40	.42
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09½
Tetralene 50 gal drs, wks lb.	...	.19	...	.19	.12	.18
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	.20	.25
Tin, crystals, 500 lb. bbls, wks lb.	.39	.39½	.38	.40	.36	.40½
Metal, NY ... lb.	* ...	.52⅛	.501	.52⅝	.45½	.55
Oxide, 300 lb bbls, wks lb.	no prices		.54	.56	.51	.56
Tetrachloride, 100 lb drs, wks ... lb.	.27	.27½	.25¼	.27½	.23	.26½
Titanium Dioxide, 300 lb bbls lb.	.13½	...	.13¾	.14	.13	.16
Barium Pigment, bbls .. lb.	.05¾	.06½	.05¾	.06½	.05¼	.06½
Calcium Pigment, bbls lb.	.05½	.05¾	.05½	.05¾	.05	.06¼

t Bags 15c lower; u + 10; * Apr. 30.

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	...	.26	...	.26	.26	.27
Toluol, 110 gal drs, wks gal.	...	.32	...	.32	.27	.32
8000 gal tks, frt all'd gal.	...	.27	...	.27	.22	.27
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ....lb.	...	1.05	...	1.05	1.05	1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	.	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.27	...	.27	...	.27
Triamylamine, drs, lcl, wks, drs ....lb.	...	.90	...	.90	.78	.90
Tributylamine, lcl, drs, f.o.b. wks ....lb.	...	.70	...	.70	.67	.70
Tributyl citrate, drs, frt all'd lb.	.24	...	.24	.26	.24	.35
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	...	.42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	...	.08	.09	.08	.09
Tricresyl phosphate, tech, drs lb.	.22	.36½	.22	.36½	.22	.36½
Triethanolamine, 50 gal drs, wks ....lb.	...	.19	...	.19	.19	.22
tks, wks ....lb.	...	.18	...	.18	.18	.20
Triethylamine, lcl, drs, f.o.b. wks ....lb.	...	1.05	...	1.05	...	1.05
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ....lb.	...	.30	...	.30	...	.30
Stearate bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest ....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	.90	.90	1.00	...	1.00
Triphenylguanidine ....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs ..lb.	...	.38	...	.38	...	.38
Tripoli, airfloated, bgs, wks ton	...	26.00	...	26.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.48	.45	.49¼	.32½	.40
Savannah, bbls ....gal.	...	.33½*	.33½	.37¼	.26½	.34
Wood Steam dist, drs, c--lcl, NY ....gal.	.42	...	.35	.40	.27	.34½
Wood, dest dist, cl-lcl, drs, delv E. cities ....gal.	...	.36*	.35	.36	.25	.32
Urea, pure 112 lb cases ..lb.	...	.12	...	.12	.12	.15½
Fert grade, bgs, c. i. f. S.A. points ....ton	no prices		no prices		...	110.00
Dom f.o.b., wks ....ton	...	85.00	...	85.00	85.00	101.00
Urea Ammonia, liq., nitrogen basis ....ton	...	121.58	...	121.58	...	121.50
Valonia beard, 42%, tannin bgs ....ton	no prices		no prices		47.00	56.00
Cups, 32% tannin bgs..ton	no prices		no prices		33.00	39.00
Extract, powd, 63% ...lb.	no prices		no prices		.0565	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .....lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol ....lb.	...	2.50	...	2.50	...	2.50
Ex-lignin ....lb.	...	2.50	...	2.50	...	2.50
Vermilion, English, kgs ..lb.	3.12	3.17	3.12	3.17	...	2.76
Wattle Bark, bgs ....ton	39.50	41.50	37.50	41.50	34.00	38.75
Extract, 60°, tks, bbls..lb.	.04⅛	.04¼	.03⅞	.04¼	.03⅞	.04¼
Wax, Bayberry, bgs ......lb.	.18	.20	.18	.20	.25	.30
Bees, bleached, white 500 lb slabs, cases ....lb.	.38	.40	.36½	.40	.35	.38
Yellow, African, bgs..lb.	nom.	.30	...	.30	.23	.29
Brazilian, bgs .....lb.	.31	.32	.31	.32	.24	.31
Refined, 500 lb slabs, cases lb.	.35	.36	.35	.36	.29	.36
Candelilla, bgs ....lb.	.21	.22	.19	.22	.18	.19
Carnauba, No. 1, yellow, bgs ....lb.	.68	.69	.68	.71	.58	.85
No. 2, yellow, bgs ...lb.	.67	.68	.66	.69	.57	.84
No. 2, N. C., bgs ....lb.	.64	.65	.62	.68	.46	.73
No. 3, Chalky, bgs ...lb.	.56	.57	.55	.59	.43	.66
No. 3, N. C., bgs ....lb.	.60	.61	.58	.63	.47	.68
Ceresin, dom, bgs .....lb.	.11	.11½	.11	.11½	.11½	.15
Japan, 224 lb cases ....lb.	.17½	.18	.16½	.18½	.15½	.16½
Montan, crude, bgs ....lb.	no prices		no prices		no prices	
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.24	.25	.24	.25	.22	.25
Cakes, cases ....lb.	.25	.26	.25	.26	.23	.25
Wood Flour, c-l, bgs ....ton						
bgs, c-l, wks ....ton	24.00	25.00	24.00	25.00	20.00	30.00
Whiting, chalk, com 200 lb	18.00	19.00	18.00	19.00	11.50	19.00
Gilders, bgs, c-l, wks ..ton	16.00	20.00	16.00	20.00	12.00	20.00
Xylol, frt all'd, East 10° tks, wks ....gal.	...	.29	...	.29	...	.30
Com'l tks, wks, frt all'd gal.	...	.26	...	.26	...	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1000 lb lots, wks ....lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ....lb.	.15	.16	.15	.16	.15	.16
Arsenite, bgs, frt all'd..lb.	...	.12	...	.12	.12	.12½
Carbonate tech, bbls, NY lb.	.14	.16	.14	.16	.14	.16
Chloride fused, 600 lb drs, wks ....lb.	...	.04¼	...	.04¼	.04¼	.046
Gran, 500 lb drs, wks lb.	...	.05	...	.05	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25	...	2.25

* April 30.

Current

Zinc Cyanide
Oil, Whale

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Zinc (continued):						
Cyanide, 100 lb drs .... lb.	.33	.35	.33	.35	...	.33
Dust, 500 lb bbls, c-l, delv lb.	...	.09¼	...	.09¼	.07½	.08½
Metal, high grade slabs, c-l,						
NY .... 1000 lb.	...	7.65	...	7.65	5.90	7.64
E. St. Louis ..... 100 lb.	...	7.25	...	7.25	4.60	7.25
Oxide, Amer, bgs, wks lb.	...	.06½	...	.06½	.06¼	.07½
French 300 lb bbls, wks lb.	...	.06¾	...	.06¾	.06¼	.07¾
Palmitate, bbls .... lb.	.24½	.27½	.24½	.27½	.23	.27½
Resinate, fused, pale bbls lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls ..... lb.	...	.22	...	.22	.21½	.24½
Sulfate, crys, 40 lb. bbls						
wks .... lb.	...	.315	...	.315	.0275	.029
Flake, bbls .... lb.	...	.335	...	.335	...	.0325
Sulfide, 500 lb bbls, delv lb.	...	.08	...	.08	.07¾	.08
bgs, delv .... lb.	...	.07¾	...	.07¾	.07½	.07¾
Sulfocarbolate, 100 lb kgs lb.	.24	.29	.24	.29	.24	.26
Zirconium Oxide, crude,						
70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Babassu, tks, futures ..... lb.	no prices		...	.06	.05¾	.06⅝
Castor, No. 3, 400 lb drs lb.	.10¾	...	.09¾	.10¾	.09¾	.12¾
Blown, 400 lb drs ... lb.	.12¾	...	.11¾	.12¾	.11¾	.14¾
China Wood, drs, spot NY lb.	.30¼	nom.	.27¼	.30¼	.22½	.28
Tks, spot NY .... lb.	...	.28½	.26¼	.28½	.21½	.27
Coconut, edible, drs NY .. lb.	...	.11	.08	.11	.07½	.09⅜
Manila, tks, NY .... lb.	...	.06½	.03⅜	.06½	.02¾	.03⅜
Tks, Pacific Coast .... lb.	...	no prices		.03¼	.02¾	.03¼
Cod, Newfoundland, 50 gal						
bbls .... gal.	.75	nom.	.60	.75	.60	.72
Copra, bgs, NY .... lb.	...	.034	.0180	.034	.0165	.0190
Corn, crude, tks, mills ... lb.	.09⅜	nom.	.06⅝	.09⅜	.05⅛	.06½
Refd, 375 lb bbls, NY .. lb.	.11½	nom.	...	.11½	.07⅞	.09
Degras, American, 50 gal						
bbls, NY .... lb.	.07¾	.08¾	.07½	.08¾	.08	.10
Greases, Yellow .... lb.	nom.	.07⅛	.04¾	.07⅛	.03	.05¼
White, choice, bbls, NY lb.	nom.	.07⅜	.05	.07⅜	.03⅜	.05⅝
Lard, Oil, Edible, prime . lb.	...	.10¾	.08½	.10¾	.08	.10
Extra, bbls .... lb.	...	.11¼	.08¼	.11¼	.06¾	.09⅜
Extra, No. 1, bbls ..... lb.	...	.11	.08	.11	.06⅞	.08⅞
Linseed, Raw less than 5						
drs lots .... lb.	...	.115	.091	.115	.09	.116
drs, c-l, spot .... lb.	.170	.190	.095	.190	.084	.110
Tks .... lb.	.10	.102	.084	.102	.078	.104
Menhaden, tks, Baltimore gal.	...	.50	.30	.50	.21	.35
Refined, alkali, drs .... lb.	...	.108	.084	.108	.067	.088
Kettle boiled, drs ...... lb.	...	.118	.096	.118	.079	.10
Light pressed, drs .... lb.	...	.098	.082	.098	.061	.085
Tks .... lb.	...	.088	.072	.088	.055	.072
Neatsfoot, CT, 20°, bbls, NY lb.	...	.16¼	..	.16¼	.15¼	.19¼
Extra, bbls, NY .... lb.	...	.11¼	.08¼	.11¼	.06⅞	.09
Pure, bbls, NY .... lb.	...	.12¼	..	.12¼	.08	.14¼
Oiticica, bbls .... lb.	.17½	.18	.16½	.19½	.17	.21
Oleo, No. 1, bbls, NY ... lb.	...	.11	.07⅜	.11	.07⅜	.07¾
No. 2, bbls, NY ..... lb	...	.10¾	.07⅜	.10¾	.07⅜	.07¾
Olive, denat, bbls, NY .. gal.	nom.	3.30	2.25	3.30	.94	2.40
Edible, bbls, NY ..... gal.	4.20	4.25	...	4.25	1.85	3.25
Foots, bbls, NY .... lb.	...	.13¾	.10¼	.13¾	.08	.10¼
Palm, Kernel, bulk .. lb.	no prices		no prices		no prices	
Niger, cks .... lb.	nom.	.05¾	.04¼	.05¾	.03¼	.05½
Sumatra, tks .... lb.	nom.	.05¼	.02	.05¼	.02⅛	.03
Peanut, crude, bbls, NY lb.	nom.	.08¾	.08¾	.09	.06¾	.09
Tks, f.o.b. mill .... lb.	no prices		.05¼	.07⅛	.05⅛	.07⅛
Refined, bbls, NY ..... lb.	nom.	.11¼	.08	.11¼	.07⅜	.09¾
Perilla, drs, NY .... lb	.18	.18½	.18	.18½	.19	.21
Tks, Coast .... lb.	...	.17	.16½	.17½	.18½	.20
Pine, see Pine Oil, Chem. Se						
Rapeseed, blown, bbls, NY lb.	nom.	.17½	nom.	.17½	.17	.17½
Denatured, drs, NY .. gal.	no prices		.95	1.00	1.00	1.05
Red, Distilled, bbls ...... lb.	.08¼	.09¼	.07¼	.09¼	.06¼	.09½
Tks .... lb.	.10½	.11½	.06¼	.11½	.05¾	.08
Sardine, Pac Coast, tks .. gal.	nom.	.55	.39	.55	.31	.39
Refined alkali, drs .... lb	...	.108	.084	.108	.067	.088
Light pressed, drs .... lb.	...	.098	.078	.098	.061	.082
Tks .... lb.	...	.088	.072	.088	.055	.072
Sesame, white, dom ...... lb.	nom.	.09½	...	.09½	.07¼	.11¾
Soy Bean, crude						
Dom, tks, f.o.b. mills .. lb.	nom.	.08⅝	.05½	.08⅝	.04¾	.06¼
Crude, drs, NY ..... lb.	.09⅛	.09¾	.06¼	.09¾	.05¾	.07¾
Ref'd, drs, NY .... lb.	.10	.10¾	.07⅝	.10¾	.07¼	.08½
Tks .... lb.	.09½	.09¾	.05⅜	.09¾	.06¼	.07⅝
Sperm, 38° CT, bleached						
bbls, NY .... lb.	...	.117	.11	.117	.105	.11
45° CT, blchd, bbls, NY lb.	...	.11	.103	.11	.098	.103
Stearic Acid, double pressed						
dist bgs .... lb.	.12¾	.13¾	.09½	.13¾	.09¾	.13
Double pressed saponified						
bgs .... lb.	.13	.14	.09¾	.14	.10	.13¾
Triple pressed dist bgs lb.	.15½	.16½	.12½	.16½	.12½	.16½
Stearine, Oleo, bbls ...... lb.	nom.	.09	...	.09	.05¼	.06½
Tallow City, extra loose .. lb.	.07⅜	...	...	.07⅜	.03⅜	.05⅜
Edible, tierces .... lb.	no prices		...	.05⅛	.04⅜	.05¾
Acidless, tks, NY ..... lb.	...	.08¾	.07½	.08¾	.06¼	.08
Turkey Red, single, drs .. lb.	...	.06½	.06½	.07	.082	.09
Double, bbls .... lb.	...	.09½	.09½	.11	.11	.12¾
Whale:						
Winter bleach, bbls, NY lb.	...	.099	...	.099	...	.095
Refined, nat, bbls, NY lb.	...	.095	...	.095	...	.091

PROFESSIONAL DIRECTORY

BOOKLETS AND CATALOGS

Chemicals

A291. Anex for Anion Exchange, Bulletin 1970; Discussion of a new substance capable of producing "distilled" water without distillation. Process industries, to which demineralized, acid-free water is necessary are included. International Filter Co.

A292. Bakelite Review, April 1941; 24-page booklet containing articles and illustrations on new applications of plastics. Bakelite Corp.

A293. Hycar Synthetic Rubber Compounding Manual for Type O. R., Vol. 1; This new oil-resistant synthetic rubber is discussed along with accelerators, adhesion to metals antitoxidants and many other properties. General recipes for various articles are given with physical properties and the volume change resulting from immersion in various solvents. Hydrocarbon Chemical and Rubber Co.

A294. Quadrafos; This brochure lists many industrial applications, describes chemical and physical properties of sodium tetraphosphate. Its ability to condition hard water, deflocculate solids, and prevent corrosion suggests many new fields for investigation. American Cyanamid Co.

A295. Resin Glue; Beautifully illustrated and well written story of synthetic resin glue describes development and uses. Plaskon Company, Inc.

A296. Synthetic Organic Chemicals, Vol. 13, No. 2; Article on "Reactions of Aromatic Acid Chlorides with Grignard Reagents" by J. H. Van Compen. Also describes some analytical reagents for iron. Eastman Kodak Co.

A297. The Clean-Up, April, 1941; In this 23-page issue, Garden Pest Control, Mole Eradication, Park Maintenance, Athlete's Foot Control and other similar articles tied up with products that will do the job. C. B. Dolge Co.

A298. The Merck Report, April 1941; Contains following articles, "Cooperation in the Field of Medical Care," "Cardiophonograph, A Method of Recording and Reproducing Heart Sounds," "Pharmacopacial 'Reference Standards,' " "A Pioneer of Professional Pharmacy," "The Study and Teaching of Pharmacology," "Views of Research, Manufacturing and Production at the Plant of Merck & Co., Inc.," "The Life Insurance Examination," "The Physician as an Expert Witness," "Current Abstracts, A Review of Recent Medical Literature in Digest Form." Merck & Co., Inc.

A299. Technical Books, Catalog No. T-6; Lists over 2,000 titles of all publishers, both new and used. Barnes & Noble, Inc.

A300. The Electrodeposition of Molybdenum; by Henry S. Myers. This is a 34-page dissertation on the research and findings of the author as partial fulfillment of the requirements for a Ph. D. degree. Climax Molybdenum Co.

A301. Tygon, Bulletin 1610; 8-page booklet describing tygon, a research development of U. S. Stoneware Co. It is a modified halide polymer much like grape jelly in original appearance and consistency. It may be used as lining for process equipment, resilient compound for making flexible sheets, tubes and moulded goods or as liquid for spraying, dipping or painting surfaces subject to corrosion. The tygon paint which comes in a number of colors is very effective for places subject to corrosive action of fumes, condensates or occasional spillage. United States Stoneware Co.

Equipment—Containers

E446. Annual Review, Sales and Engineering Developments; 100-page book devoted to a review of 1940. Contains five sections, namely, Allis-Chalmers and National Defense, Blowers and Compressors Department, Crushing, Cement and Mining Department, Electrical Department, Engine and Condenser Department, Feedwater Treating Department, Hydraulic Department, Milling Machinery Department, Steam Turbine Department and Tractor Department. Allis-Chalmers Mfg. Co.

E447. Cash Standard, General Catalog No. 20; 48-page booklet of valves and control equipment for the automatic control of fluid pressures. A. W. Cash Co.

E448. Centralized Lubrication, Bulletin No. 411; Describes and illustrates method of lubrication. Trabon Engineering Corp.

E449. Crushing; "Rolling Ring" and swing hammer crushers, grinders and shredders for the laboratory are described and illustrated in 8-page bulletin. American Pulverizer Co.

E450. Dixie Hammermills; Describes, illustrates and gives specifications for crushing, pulverizing, grinding and shredding equipment. Dixie Manufacturing Co.

E451. Drafting Standards, Accepted and Proposed; 30-page booklet containing following sections: Arrangement of Views, Lines and Line Work, Sectional Views, Dimensioning, Screw Thread Representation for Bolts and Threaded Parts, Trimmed Sizes of Drawing Paper and Cloth, Lettering. Higgins Ink Co., Inc.

E452. Filter Presses; 4-page illustrated folder gives information and details concerning presses for use with vegetable and animal fish oils. T. Shriver & Company.

E453. Glass Pump, Bulletin 336; 8-page booklet describes, illustrates and gives engineering information on centrifugal pump made of pyrex which insures resistance to corrosion. The Nash Engineering Co.

E454. Heating Cable, GEA-3539; Pamphlet discusses flexible, lead covered cable which can be bent and formed to fit almost any low-temperature heating job involving temperatures of 165° F. or below. General Electric Co.

E455. Homogeneous Linings; Describes and illustrates all types of chemical and process equipment from laboratory size to tank cars lined with lead, tin, rubber and rubber plastics. Homogeneous Equipment Co.

E456. Inco, Vol. 17, No. 4; Spring edition of the quarterly magazine devoted to the uses of nickel and its alloys. Among its articles; "Shipshape" Finishes for Marine Hardware, Soap Plant Production Boosted by Shift of Doctor Blades, The Farmer Goes to Sea (all about oysters), Flame Annealing Permits Spinning-on of Cast, Heat-Treated Valve Discs, and others, 36 pages of them. International Nickel Co., Inc.

E457. Kjeldahl Nitrogen Apparatus and Associated Apparatus and Laboratory Tables; 32-page booklet describes, illustrates and gives specifications for complete line of equipment and apparatus. Laboratory Construction Co.

E458. Manufacture of Rubber Printing Plates, Bulletin No. 9810; Just-issued six-page bulletin summarizing processes involved, materials and methods developed by Company's technical and research staffs. A step by step discussion which compares process with others in use. B. F. Goodrich Co.

E459. Monel Metal Drums; Folder illustrates, describes and gives specifications for drums made of Monel, a nickel-copper alloy. The Stevens Metal Products Co.

E460. Multi-Stage Blowers, Bulletin No. B-6104; 32 pages of well-illustrated material cover centrifugal type blowers built in standard sizes for inlet volume up to 130,000 cubic feet per minute, and larger, for air pressures up to thirty-five pounds gauge. Allis-Chalmers Mfg. Co.

E461. Nickel Drums; Folder describes, illustrates and gives specifications for pure nickel drums of use in a number of storing and shipping problems caused by corrosive contents. The Stearns Metal Products Co.

E462. Non-Indicating Air Operated Controllers, No. 77-2; Describes controller of the air operated remote bulb type. The booklet is well illustrated to show important operating features, constructional features and exterior views, etc. The Brown Instrument Co.

E463. Packomatic; Folder describes carton forming machine for making unprinted cartons from rolls of chipboard. J. L. Ferguson Co.

E464. Peneflex Flexible Interlocked All-Metal Hose for Tank Cars, Bulletin No. 55F; Describes exactly what title says, a hose which also may be used in the tank truck and marine field. Pennsylvania Flexible Metallic Tubing Co.

E465. Pumps, Compressors and Engines, Bulletin QP 10, Third Edition; Presents standard types of air compressors, pumps, and rotary drilling equipment in a brief and comprehensive manner. Enables prospective buyer to select size and type suited to his specific needs. Gardner-Denver Co.

E466. Reduction, Grinding and Handling Equipment; 6-page folder giving range, operation and construction of crushers, grinding mills, pulverizers, mixers, sifters, etc. Also illustrates and describes some elevators and conveying machinery. Robinson Manufacturing Co.

E467. Stearns Magnetic Magic, Bulletin No. 101; Newly-enlarged laboratory facilities and equipment for making bests of materials in order to determine best methods of solving industrial and mining problems is the subject of "The House of Stearns Magnetic Magic." Touches metallurgical research, problems of separation, concentration, reclamation, protection and purification of minerals, ore, etc. Stearns Magnetic Mfg. Co.

(*Continued on page 669*)

Chemical Industries
522 5th Avenue
New York City

I would like to receive the following booklets:

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Name ....

Title ....

Company ....

Address ....

All information requested above *must* be given to receive attention.

Index to Advertisers

"We"—Editorially Speaking

Said *Time* in its April 21st issue in introducing its report on the St. Louis meeting of the American Chemical Society:

"Last week found the U. S. again in the season when scientists come out of their laboratories, blink, stretch and bustle off to share with the world their newest findings.."

Such a feat of journalism rates at least the coveted Pulitzer Prize for 1941!

We have been hearing a great deal recently about "bottlenecks" in supplies and in production. Alvin E. Dodd, president of the American Management Association, has performed a service in pointing out that in the general clamor over labor difficulties we hear little about the possible management bottleneck.

"But as a matter of fact," points out Mr. Dodd, "in many places such a bottleneck already exists and it threatens to spread even further. In factories steady mechanization of processes has lightened the load for labor, but no machines have been invented to replace managerial skills. No wonder then that psychiatrists are busy treating frayed nerves when eighty-hour weeks are not uncommon."

We believe that Mr. Dodd's point is well taken and is definitely something that management will have to give serious thought to. No alphabetical agency has been set up in Washington to solve this one.

Orchids to the St. Louis Section of the American Chemical Society for the manner in which the A. C. S. meeting was conducted in the face of very great difficulties.

Despite the pleasant and instructive visits to the American Wine Company and Anheuser-Busch at St. Louis we hope that the Atlantic City meeting will omit plant trips entirely. The time can well be devoted to walks along the boardwalk or in informal talks. Those attending will need rest and diversion.

A lot of Americans are going to discover that we are working on a defense program when they start to turn in that old jallopy. The Sun Dialer, H. I. Phillips says:

"We await the appearance of that sterling 100 percenter who boasts that he is ready to make the great sacrifice of driving to the defense rally in a car with no radiator changes."

Establishments which accounted for 85.5 per cent. of the total value of all manufactured products in '39, 95,909 factories, spent $1,337,588,872 in capital outlays for plant and equipment in that year. The chemical industries ranked third, with $125,009,766. Petroleum and coal products were fourth, with $122,835,736. Food industries were, of course, first, and iron and steel second.

Rumors have it that the Reich is buying large quantities of arsenic for the production of new poison gases. According to Dr. Curt Wachtel, a former close associate of Fritz Haber, and now living in the United States, the American people should not forget the importance of research and the building up of a chemical and industrial organization able to supply large quantities of whatever materials are needed for gas war. Dr. Wachtel has just written a new book "Chemical Warfare" published by the Chemical Publishing Company of Brooklyn.

For years tremendous quantities of arsenic have been accumulating in Sweden as a byproduct of metallurgical operations while scientists have sought to find industrial uses. Let us do more than hope that such a diabolical application will not be the "surprise" of the present war.

CHEMICAL INDUSTRIES' Guidebook questionnaires for the Raw Materials, Chemicals and Chemical Specialties Sections have been mailed. Your cooperation is earnestly solicited. Please see that these are returned promptly. Each year we receive complaints from concerns asking why their names have been omitted. While we do not claim to be infallible we do find that in most instances those complaining failed to return the questionnaire. About the only criticism that users of the "Guide" have is that in a few cases concerns check products they do not handle or warehouse. Steps have been taken to further correct this practice, but we ask your cooperation. A company that checks an item only to report later by letter or on the phone that that product is not handled only does a dis-service to all concerned.

Users of this valuable "guide" will be delighted we know to learn that the next number, out in October, will contain an Equipment and Container Section, thus rounding out a complete service to buyers. Hundreds of regular users have asked for it and we are glad to supply such a service.

The chemical industry, according to defense officials, normally takes about five per cent. of the country's production of aluminum. The food and beverage industries use six per cent.

We pause to report that General Somervell recently told a Senate Committee that two industrial concerns had contributed their services supervising defense construction on the basis of $1 payment for each $10,000,000 involved in the project. One of these concerns was Humble Oil.

The War Department has issued two recent ordinances. The first provides that "all inspectors of ordnance shall be men."

The second states that "all women employed in Ordnance Plants shall be inspected to make sure that they do *not* wear rayon underwear."

"C. I." introduces in this issue its first eight-page "gate-fold." Four pages of pictures feature the St. Louis A. C. S. Meeting. We hope you like it and wish to publicly thank Monsanto's official photographer, "Bob" Fisher, for certain of the photos on these and other pages of this issue.

Did you know—

Brazil is said to be using its surplus coffee to make plastics?

The latest in detergents is a coffee soap?

Waxy coatings for steel to prevent rusting are competing with greases?

Fifteen Years Ago

From Our Files of May, 1926

Dorland's "Synthetics" nose out the "Paralytics" in 10-inning baseball game at Salesmen's Spring Outing.

P. M. Dinkins elected a vice-president of Kalbfleisch.

Match makers discuss formation of a national trade organization.

Penn Salt absorbs Eagle Lye Works.

Clement C. Speiden, chairman of the board of Innis Speiden & Co., dies in England.

M. H. Haertel resigns as assistant treasurer of Miner Edgar and plans European trip.

DNE. √5/26/41

State of Chemical Trade

Current Statistics (April 30, 1941)—p. 80

WEEKLY STATISTICS OF BUSINESS

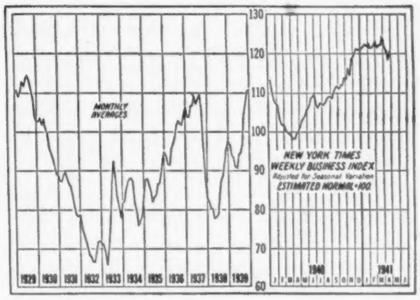
Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output† 1941	Electrical Output† 1940	Electrical Output† % of Change	Jour. of Com. Price Index	*Nat'l Fertilizer Ass'n Price Indices Chem. & Drugs	*Nat'l Fertilizer Ass'n Price Indices Fats & Oils	*Nat'l Fertilizer Ass'n Price Indices Fert. Mat.	*Nat'l Fertilizer Ass'n Price Indices Mixed Fert.	*Nat'l Fertilizer Ass'n Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Mar. 29	792,125	628,921	+25.9	2,802,255	2,422,287	+15.7	85.1	104.0	88.3	106.1	102.0	102.9	80.6	99.8	124.3	88.3
Apr. 5	683,402	602,835	+13.4	2,778,628	2,381,456	+16.7	85.5	104.0	92.4	106.4	102.0	103.7	80.9	99.2	121.7	88.7
Apr. 12	679,808	619,105	+ 9.8	2,720,790	2,417,994	+12.5	85.9	104.3	96.0	106.9	102.0	104.2	81.7	99.3	120.6	89.2
Apr. 19	708,651	628,468	+12.8	2,701,879	2,421,576	+11.6	86.4	104.9	98.1	107.0	101.2	104.4	82.2	99.3	118.6	89.7
Apr. 26	721,702	694,804	+11.9	2,750,277	2,397,626	+14.7	86.1	104.7	97.9	106.9	101.2	104.1	82.6	96.0	120.4	89.9

† K.W.H. 000 omitted. * Base period changed Jan. 4 from 1926-1928 average to 1935-1939 average as 100.

MONTHLY STATISTICS

CHEMICAL:	Mar. 1941	Mar. 1940	Feb. 1941	Feb. 1940	Jan. 1941	Jan. 1941
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	......	......	226,069	212,719	221,788	235,023
Consumpt. in mfr. fert.	......	......	162,306	158,592	184,149	182,160
Stocks end of month	......	......	100,338	93,132	91,407	92,040
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	21,702,074	20,983,159	22,030,203	20,381,276	24,223,921	20,652,921
Comp. denat. prod., wine gal...	513,986	413,509	462,031	453,848	670,126	1,303,991
Removed, wine gal.	519,084	399,479	450,931	412,602	657,814	1,317,519
Stocks end of mo., wine gal...	470,282	340,800	475,811	327,290	464,984	287,164
Spec. denat. prod., wine gal. ...	12,678,139	9,110,799	10,093,722	8,005,830	9,940,263	9,093,651
Removed, wine gal.	12,819,899	9,094,254	10,107,165	8,092,287	9,841,036	8,828,435
Stocks end of mo., wine gal...	842,969	1,051,623	989,130	1,038,274	1,002,940	1,129,656
Ammonia sulfate prod., tons a..	645,235	56,054	58,359.5	53,474.5	64,669.5	60,393
Benzol prod., gal. b	13,505,000	9,952,000	11,765,000	11,536,000	13,130,000	11,424,000
Byproduct coke, prod., tons a..	4,999,309	4,124,748	4,502,091	4,016,742	4,932,989	4,707,068
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	844,819	789,307	720,173	723,107	719,336	878,316
Sheets, ship., lbs.	794,199	607,267	755,513	594,261	704,497	749,002
Rods, prod., lbs.	363,429	231,297	314,560	246,298	349,402	291,806
Rods, ship., lbs.	342,024	255,511	299,793	257,399	329,138	275,316
Tubes, prod., lbs.	99,345	69,036	97,399	46,797	97,794	68,702
Tubes, ship., lbs.	96,298	61,739	89,831	66,739	78,760	56,805
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	464,601	550,138	441,482	636,834	616,525	857,277
Shipments, lbs.	372,804	588,516	502,025	655,076	674,574	751,429
Molding comp., ship.; lbs. ...	1,990,982	1,021,579	1,641,978	877,685	1,583,885	1,023,808
Methanol (Bureau of the Census)						
Production, crude, gals.	454.817	506,937	435,079	446,815	449,529	457,271
Production, synthetic, gals.	3,672.830	3,462,946	3,170,636	3,782,402	3,420,013	3,452,677
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	3,806,132	2,793,435	3,466,902	......	3,056,526	2,909,785
Heavy goods, ship., linear yds..	3,294,035	2,184,457	3,032,393	......	2,824,339	2,143,625
Pyroxylin spreads, lbs. c	6,691,648	4,769,189	6,262,184	......	3,903,335	5,131,394
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. d..	......	......	$18,554	$16,670	$18,377	$20,432
Crude sulfur d	......	......	$739	$849	$932	$1,001
Coal-tar chemicals d	......	......	$2,269	$2,421	$2,661	$2,895
Industrial chemicals d	......	......	$4,741	$4,727	$5,106	$4,189
Imports						
Chemicals and related prod. d..	......	......	$4,067	$5,422	$4,572	$6,670
Coal-tar chemicals d	......	......	$624	$419	$846	$1,182
Industrial chemicals d	......	......	$806	$1,136	$1,118	$1,408
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	......	......	127.9	121.0	126.1	121.0
Other than petroleum	......	......	130.1	121.1	127.8	120.9
Chemicals	......	......	155.0	136.1	152.0	135.8
Explosives	......	......	159.9	105.5	150.7	103.5
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	......	......	144.4	131.4	142.1	131.0
Other than petroleum	......	......	148.3	130.4	145.2	130.3
Chemicals	......	......	194.0	159.7	188.2	159.8
Explosives	......	......	205.3	127.5	198.8	120.9
Price index chemicals*	......	......	78.5	77.5	78.6	77.7
Drugs & Pharmaceuticals* ...	......	......	96.9	81.3	96.5	81.3
Fert. mat.*	......	......	70.4	71.0	70.7	71.3
Paint and paint mat.	......	......	86.6	86.8	86.7	87.2
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	......	......	94,316	53,398	109,654	56,602
Total phosphate rock	......	......	70,812	16,708	84,814	20,590
Total potash fertilizers	......	......	6,450	475	11,819	724
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	......	......	97,677	147,975	85,580	148,382
Sodium nitrate	......	......	40,254	26,506	34,332	56,627
Total potash fertilizer	......	......	1,436	65,486	2,765	41,798

INDUSTRIAL TRENDS



Business: Industrial Activity showed some further increases in March. The Federal Reserve Boards' index of production rose from 141 to 143 per cent of the 1935-1939 average. Production declined during April owing to strikes in the coal and automobile industries. For April the index is expected to drop to about 138. The **New York Times** Index of Business Activity decreased from 124.3 on March 29 to 120.4 on April 26. During March the new orders index of the Department of Commerce rose 12 points to 201.

Steel: Steel production had been going along at capacity levels until recently when the coal strike caused a serious shortage of fuel. In commenting on the situation "The Iron Age" said "The loss cannot be measured by the decline of a few hundred thousand tons of ingots which will be shown by the April figures as compared with those of March. There has been an even greater loss in pig iron production, which is irreparable, and a still further loss which cannot be shown in figures, caused by deflection of mill stocks of coal, coke, pig iron and scrap."

About the middle of April, Price Administrator Leon Henderson froze steel prices at their first quarter prices. A gradual tightening of government control over steel products is under way by the Office of Production Management.

Automotive: Production of automobiles, which usually increases considerably in March, showed little change from the high rate reached in February. Factory sales of complete units during March were 507,868 compared with 485,523 for February. During March retail sales of new passenger

State of Chemical Trade
Current Statistics (April 30, 1941)—p. 80

State of Chemical Trade

Current Statistics (April 30, 1941)—p. 81

cars and trucks reached 526,798, the highest figure in ten years. Stocks which had been built up to about 580,000 units in February have now been reduced to less than 500,000.

Carloadings: Railroad freight traffic is keeping at record levels. In week ended May 3 loadings advanced sharply to about 793,000 cars.

Loadings are expected to increase steadily and to reach huge proportions late in summer when shipments of farm produce and full-scale defense production coincide.

Electric Output: During the first four weeks of April the production of electric power in the United States amounted to about 10,951,574 KWH. This represents an increase of approximately 13.8 per cent over the similar period of last year.

Construction: According to the F. W. Dodge Corporation, construction contract awards rose sharply in March and were larger than in any month since the middle of 1930. Publicly financed work and privately financed factory construction were chiefly responsible for the increase. Awards for private residential building, which had been unusually large during the winter months, showed less than seasonal increase in March.

Textiles: There were further increases in activity in textile operations during March. Woolen textile mills which usually slack off in March failed to follow the seasonal trend and remained at peak levels. Cotton and rayon maintained their high levels.

Commodity Prices: Prices continued to rise sharply during March and April. Nearly all of the wholesale price indexes, covering basic commodities and manufactured articles, showed advances. The Government has taken stronger steps to discourage price increases. In this direction ceilings were put on steel, bituminous coal, secondary and scrap aluminum and zinc, and iron and steel scrap.

Retail Trade: Department store and mail order sales increased seasonally while variety store sales showed more than usual rise. The Federal Reserve Board Index of Department Store Sales rose to about 105 for April and is expected to go higher in May.

Outlook: It is quite certain that industrial activity will continue at a very rapid pace for quite some time. Plans and plants which were started during the past year are coming into operation and will result in a steadily swelling volume of production. With events pointing more clearly each day toward a long war and possible American participation there seems to be no indication of a let up in industrial activity.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	Mar. 1941	Mar. 1940	Feb. 1941	Feb. 1940	Jan. 1941	Jan. 1940
Superphosphate e (Nat. Fert. Association)						
Production, total	......	......	334,697	318,788	338,546	391,803
Shipments, total	......	......	350,343	269,588	231,808	213,248
Northern area	......	......	129,961	88,574	88,013	85,647
Southern area	......	......	220,382	181,014	143,795	127,601
Stocks, end of month, total	......	......	1,967,724	2,006,283	1,943,182	1,913,279
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,487,101	1,639,828	858,255	717,752	545,772	459,023
Total, 12 southern	1,367,307	1,538,065	765,196	676,256	520,644	410,389
Total, 5 midwest	119,794	101,763	93,059	41,496	25,128	48,634
Fertilizer employment *i*	......	......	110.2	109.3	104.2	105.1
Fertilizer payrolls *i*	......	......	90.6	83.7	85.9	82.5
Value imports, fert. and mat. *d*	......	......	$2,109	......	$1,765	$3,260
GENERAL:						
Acceptances outst'd'g *f*	......	......	$211	$233	$212	$229
Coal prod., anthracite, tons	......	......	4,430,000	4,977,000	4,975,000	5,622,000
Coal prod., bituminous, tons	......	......	41,450,000	44,070,000	43,905,000	44,976,000
Com. paper outst'd'g *f*	......	......	$240	$226	$232	$219
Failures, Dun & Bradstreet	......	......	......	......	1,120	1,237
Factory payrolls *i*	......	......	126.4	99.3	120.7	99.8
Factory employment *i*	......	......	117.7	105.0	115.5	105.0
Merchandise imports *d*	......	......	$233,702	$200,068	$228,636	$241,897
Merchandise exports *d*	......	......	$303,413	$347,106	$325,355	$368,584
GENERAL MANUFACTURING:						
Automotive production	507,868	423,620	485,523	404,032	500,931	432,279
Boot and Shoe prod., pairs	......	......	38,005,922	36,442,348	36,631,597	33,884,856
Bldg. contracts, Dodge *j*	......	......	......	......	$305,205	$196,191
Newsprint prod., U. S. tons	87,376	85,143	79,720	81,455	89,124	84,126
Newsprint prod., Canada, tons.	275,769	251,279	245,607	231,823	261,298	251,032
Glass containers, gross‡	5,128	4,606	4,368	4,123	4,513	4,263
Plate glass prod., sq. ft.	18,266,400	14,302,100	15,664,200	13,175,200	19,350,100	17,257,200
Window glass prod., boxes	1,416,869	1,107,400	1,397,100	1,099,100	1,561,200	1,413,500
Steel ingot prod., tons	......	......	6,250,413	4,527,141	6,943,084	5,768,729
% steel capacity	......	......	96.8	70	97.1	83.18
Pig iron prod., tons	4,704,135	3,270,499	4,197,872	3,311,480	4,663,695	4,032,022
U.S. cons'pt. crude rub., lg. tons	......	......	61,016	49,832	64,225	56,539
Tire shipments	......	......	4,910,365	4,112,379	4,846.991	4.270.137
Tire production	......	......	5,165,404	4,888,250	5,472,043	4,953,585
Tire inventories	......	......	10,071,857	10,123,824	9,797,253	9,347,953
Cotton consumpt., bales	......	......	793,626	661,771	843,274	731,793
Cotton spindles oper.	22,795,742	22,553,360	22,769,368	22,800,726	22,820,724	22,880,270
Silk deliveries, bales	......	......	......	......	24,639	26,841
Wool consumption *s*	......	......	......	......	46.4	34.4
Rayon deliv., lbs.	......	......	31,600,000	29,800,000	34,300,000	31,800,000
Rayon employment *i*	......	......	317.5	313.3	313.5	313.5
Rayon payrolls *i*	......	......	337.0	321.3	335.9	320.4
Soap employment *i*	......	......	90.3	84.4	85.9	83.5
Soap payrolls *i*	......	......	114.0	100.3	107.7	100.3
Paper and pulp employment *i*	......	......	117.2	113.0	115.7	114.1
Paper and pulp payrolls *i*	......	......	132.0	116.9	127.5	117.6
Leather employment *i*	......	......	87.8	86.6	85.8	87.4
Leather payrolls *i*	......	......	92.1	83.3	86.7	86.1
Glass employment *i*	......	......	115.0	102.5	114.3	105.6
Glass payrolls *i*	......	......	135.2	108.3	131.2	113.1
Rubber prod. employment *i*	......	......	100.8	88.0	98.8	90.0
Rubber prod. payrolls *i*	......	......	113.9	88.4	111.0	94.1
Dyeing and fin. employment *i*	......	......	139.8	130.1	134.9	129.7
Dyeing and fin. payrolls *i*	......	......	129.2	109.2	120.2	109.5
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	93.7	59.9	83.6	61.8	82.4	59.3
Gasoline prod., *p*	......	......	......	......	52,542	50,243
Cottonseed oil consumpt., bbls.	314,505	243,671	306,551	214,583	383,739	266,410
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	......	......	......	......	34,604,629	28,666,635
Trade sales (680 estbts.) dollars	......	......	......	......	16,314,158	13,549,867
Industrial sales, total, dollars	......	......	......	......	15,092,044	12,317,340
Paint & Varnish, employ. *i*	......	......	128.8	123.2	126.3	123.5
Paint & Varnish, payrolls *i*	......	......	142.0	128.3	137.4	128.5

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; *New series beginning March, 1940; [1] Revised series beginning February, 1940.

Chemical Finances
April, 1941—p. 80

American Cyanamid Earnings Up

Report of American Cyanamid Co. and subsidiaries for year ended December 31, 1940, shows net income, excluding equity in undistributed net income of associated companies, of $6,629,729 after depreciation, depletion, interest, federal income taxes, $1,000,000 provision for contingencies and $925,000 provision for excess profits taxes, equal after dividends on 5% preferred stock, to $2.44 a share on combined 2,618,364 shares (par $10) of Class A and B common stocks, excluding 59,679 shares of Class B stock in treasury. Including equity in undistributed earnings of associated companies, net profit was equal to $2.57 a share.

This compares with net profit of $5,524, 941 or $2.07 a share on combined 2,618,369 Class A and B shares, and including equity in undistributed earnings, net profit was equal to $2.19 a share on combined A and B stocks.

Newport Industries Earns $.50 a Share

Report of Newport Industries, Inc., for year ended December 31, 1940, certified by independent auditors, shows net profit of $311,230 after depreciation, amortization, interest, federal income taxes, etc., equal to 50 cents a share (par $1) on 621,359 shares of capital stock.

This compares with $409,311 or 66 cents a share in 1939.

Dividends and Dates

Name	*Per Share*	*Payable*	*Stock Record*
American Smelting & Refining Co.	$0.50	May 31	May 2
Celanese Corp. of America			
7% Cum. 1st part pref. semi-ann.	3.50	June 30	June 17
7% Cum prior pref. 1st pref semi-ann.	3.50	June 30	June 17
quar.	1.75	July 1	June 17
Diamond Match Co.			
common	.25	June 2	May 13
Pref. semi-ann.	.75	Sept. 2	Aug. 12
Dow Chemical Co.,			
common	.75	May 15	May 1
5% Pref quar.	1.25	May 15	May 1
Fansteel Metallurgical Co.			
$5 Pref. quar.	1.25	June 30	June 14
$5 Pref. quar.	1.25	Sept. 30	Sept. 15
$5 Pref. quar.	1.25	Dec. 18	Dec. 15
Hercules Powder Co.			
Pref. 6% quar	1.50	May 15	May 2
Hooker Electrochemical Co.	.30	May 31	May 14
Monsanto Chemical Co.			
quar.	.50	June 2	May 10
$4 Pref. C initial	.84	June 2	May 10
$4.25 Pref. A S-A	2.25	June 2	May 10
$4.25 Pref. B semi-ann.	2.25	June 2	May 10
National Chemical and Mfg. Co. extra	.10	June 16	June 2
National Gypsum Co.			
$4.50 Pref. quar	1.125	June 2	May 14
New Jersey Zinc Company	1.00	June 10	May 10
Sherwin-Williams Co.	.75	May 15	Apr. 30
Pref. quar.	1.25	June 2	May 15
Standard Oil Co. of Calif.			
quar.	.25	June 16	May 15
Standard Oil Co. of N. J.			
semi-annual	.50	June 16	May 15
United Chemicals, Inc.			
part pref.	.75	June 2	May 10
U. S. Potash Co.			
6% Pref. quar.	1.50	June 16	June 2

Price Trend of Representative Chemical Company Stocks

	Mar. 29	Apr. 5	Apr. 12	Apr. 19	Apr. 26	Net gain or loss last mo.	Price on Apr. 27 1940	1941 High	1941 Low
Air Reduction Co.	37⅜	37¾	37	36	36	—1⅜	48⅜	42½	35¾
Allied Chemical & Dye	154¼	157½	150½	149¼	148	—6¼	179½	165	144½
Amer. Agric. Chem.	14⅝	15⅞	14⅝	14¾	15⅛	+ ½	18⅜	17¾	14⅜
American Cyanamid "B"	34¼	36⅜	35¼	34¾	34¾	+ ½	38¼	38	31
Columbian Carbon	77	77½	76	71⅞	71⅛	—5⅞	94	80⅛	69⅞
Commercial Solvents	9⅞	11¼	10⅛	9½	9⅝	— ¼	15	11½	8⅜
Dow Chemical Co.	127½	129	124	128	124⅜	—3⅛	170	141¾	122
du Pont de Nemours	145⅛	149	142⅝	140⅝	140⅛	—5	188	164¾	138
Hercules Powder Co.	71½	70	69½	67½	67½	—4	98.	77½	66
Mathieson Alkali	25	26¼	25⅜	25	24¾	— ¼	31	30	24¼
Monsanto Chemical Co.	79	81	80⅝	79½	79½	+ ½	115¾	88½	77
Standard Oil of N. J.	35⅜	36⅜	35	35⅜	35½	+ ¼	42	36½	33
Texas Gulf Sulphur	35	35⅝	35¼	32½	31⅝	—3⅜	34⅝	38	34½
Union Carbide & Carbon	65⅞	67⅞	63¾	63½	63½	—2⅜	83	70⅞	60
U. S. Industrial Alcohol	25	25	22	20	22	3	27	28¾	20

Earnings Statements Summarized

Company:	Annual divi-dends	Net income 1940	Net income 1939	Common share earnings 1940	Common share earnings 1939	Surplus after dividends 1940	Surplus after dividends 1939
Abbott Laboratories:							
March 31 quarter	y$2.15	‡$1,060,483	‡$909.885	....	....	......	......
Air Reduction Co., Inc:							
March 31 quarter	y 2.00	1,928,837	1,442,991	.71	.53	......	......
American Agricultural Chemical Co.:							
Nine months, April 3	y 1.20	153,206	†104,088	.24	....	......	......
American Cyanamid Co.:							
March 31 quarter	x .60	1,697,372	1,467,158	.60	.53	......	......
American Maize-Products Co.:							
Year, December 31	k 1.25	519,714	777,663	1.73	2.59	......	......
Archer-Daniels-Midland Co.:							
Nine months, March 31	y 1.55	1,571,257	2,016,023	2.88	3.52	......	......
Atlas Powder Co.:							
March 31 quarter	y 4.25	440,282	364,696	1.41	1.11	......	......
Catalin Corp. of America:							
March 31 quarter	y .25	67,787	51,733	.12	.09	......	......
Celluloid Corp.:							
Twelve months, March 31	f ...	390,662	247,179	....	....	......	......
Climax Molybdenum Co.:							
March 31 quarter	y 2.20	1,844,925	1,718,715	.73	.68	......	......
Commercial Solvents Corp.:							
March 31 quarter	y .25	556,992	513,560	.21	.19	......	......
du Pont (E. I.) de Nemours & Co.:							
March 31 quarter	y 7.00	20,754,161	23,727,188	j1.77	j2.04	d$507,408	$2,477,914
Formica Insulation Co.:							
March 31 quarter	y 1.50	122,617	115,519	.75	.70	......	......
Freeport Sulphur Co.:							
March 31 quarter	y 2.50	697,985	861,233	.87	1.08	......	......
Hercules Powder Co.:							
March 31 quarter	y 1.00	1,360,426	1,742,573	.93	1.22	439,168	821,315
Interchemical Corp.:							
March 31 quarter	y 1.60	296,301	228,205	.68	.45	......	......
Twelve months, March 31	y 1.60	1,175,124	1,491,453	2.70	3.79	*......	......
Johns-Manville Corp.:							
March 31 quarter	y 3.50	1,561,588	777,694	1.73	.76	836,588	646,444
Mathieson Alkali Works, Inc.:							
March 31 quarter	y 1.50	403,515	364,142	.44	.39	......	......
Monsanto Chemical Co.:							
March 31 quarter	y 3.00	1,342,707	......	.98	gg.88	......	......
National Oil Products Co.:							
March 31 quarter	y 1.85	203,628	157,703	h.94	h.88	......	......
Newport Industries, Inc.:							
March 31 quarter	y .30	110,959	159,860	.18	.26	......	......
Twelve months March 31	y .30	270,256	500,184	.43	.80	......	......
Norwich Pharmacal Co.:							
March 31 quarter	y 1.00	194,623	192,640	.24	.24	......	......
Procter & Gamble Co.:							
March 31 quarter	y 2.50	7,166,041	7,686,610	1.09	1.18	......	......
‡‡ Nine months, March 31	y 2.50	16,776,068	22,273,148	2.55	3.40	......	......
Sharp & Dohme, Inc.:							
March 31 quarter	w .20	351,701	303,687	.19	.13	......	......
Twelve months, March 31	w .20	1,222,916	1,023,931	.54	.29	......	......
Staley (A. E.) Mfg. Co.:							
March 31 quarter	k .70	488,722	692,188	....	....	......	......
Texas Gulf Sulphur Co.:							
March 31 quarter	y 2.25	2,147,381	2,045,008	.56	.53	......	......
Twelve months, March 31	y 2.25	9,243,261	8,458,025	2.41	2.20	......	......
Union Carbide & Carbon Corp.:							
March 31 quarter	y 2.70	10,545,635	10,468,706	1.14	1.13	......	......
United Chemicals, Inc.:							
March 31 quarter	f ...	56,593	38,922	....	....	......	......
U. S. Rubber Reclaiming Co., Inc.:							
Year, Wecember 31	f ...	207,601	405,192	.01	2.29	......	......
Victor Chemical Works.:							
March 31 quarter	y 1.40	318,216	226,990	.46	.32	......	......
Westvaco Chlorine Products Corp.:							
March 31 quarter	y 1.85	372,620	360,596	h.86	h.85	......	......

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *p* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* Paid on or declared in last 12 months plus extra stock. *w* Last dividend declared, period not announced by company.

Chemical Finances
April, 1941, p. 81

Chemical Stocks and Bonds

Price Range April 1941 Last	April 1941 High	April 1941 Low	1940 High	1940 Low	1939 High	1939 Low	Sales (Number of shares) April 1941	Sales 1941	Stocks	Par $	Shares Listed	Dividends 1940*	Earnings** $-per-share-$ 1940	1939	1938
NEW YORK STOCK EXCHANGE															
48	53	46	70¼	49¼	71½	53	1,600	9,700	Abbott Labs.	No	755,204	2.15	2.89	2.61	2.43
37¾	42½	35¾	58⅛	36½	68	45¼	16,200	107,300	Air Reduction	No	2,711,137	1.75	2.38	1.98	1.47
146	165	144½	182	135½	200½	151½	6,400	26,100	Allied Chem & Dye	No	2,401,288	6.00	9.43	9.50	5.92
15¼	17¾	14⅝	21	12⅛	24½	16	4,000	20,600	Amer. Agric. Chem.	No	627,981	1.20	1.45	1.22	2.23
4¾	6⅛	4⅝	8¼	4⅛	11⅞	5½	1,900	18,100	Amer. Com. Alcohol	No	280,934	...	.22	—.38	—2.05
27⅛	30	26	35½	23	37	21	1,500	4,200	Archer-Dan.-Midland	No	545,416	1.40	5.71	3.82	.43
62½	72¼	62½	80½	57	71	50	400	3,500	Atlas Powder Co.	No	252,278	4.25	5.71	3,82	2.69
115½	118½	111	124¾	112½	127	116	310	1,150	5% conv. cum. pfd.	100	68,597	5.00	26.01	18.94	14.77
20¾	28⅜	20	35½	20	30¼	13⅝	12,300	49,400	Celanese Corp. Amer.	No	1,112,788	1.25	3.38	3.53	.20
119½	120¾	116¾	121	105½	109⅞	84	840	5,640	prior pfd.	100	164,818	7.00	38,69	38.67	15.05
12¼	13	11⅛	20	10⅛	18	11⅛	11,500	51,400	Colgate-Palm.-Peet	No	1,962,087	1.00	1.72	2.74	1.77
70¼	80⅛	69⅞	98¾	71	96	73	800	7,100	Columbian Carbon	No	537,406	4.60	5.71	5.32	5.13
9¾	11½	8⅝	16⅝	8	16	8⅝	52,600	136,200	Commercial Solvents	No	2,636,878	.25	.91	.61	—.11
45½	47½	42¼	65⅛	40¼	67½	54⅞	11,800	64,100	Corn Products	25	2,530,000	3.00	3.10	3.32	3.18
170	182½	170	184	165	177	150	510	2,530	7% cum. pfd.	100	245,738	7.00	38.99	41.18	30.69
13⅝	17¼	13	23¼	12½	32⅝	18	1,600	10,340	Devoe & Rayn. A.	No	95,000	.25	1.14	2.08	—1.72
124⅜	141¾	122	171	127¼	144⅝	101½	3,500	15,200	Dow Chemical	No	1,135,187	3.00	6.65	3.76	3.91
138¼	164¾	139	189¼	146½	188½	126¼	24,600	105,100	DuPont de Nemours	20	11,065,762	7.00	7.23	7.70	3.74
124	125⅞	120⅞	129⅝	114	124⅛	112	1,450	11,150	4½% pfd.	No	1,688,850	4.50	51.48	52.25	87.27
123¼	142	124	166¾	117	186⅛	138⅛	6,800	30,000	Eastman Kodak	No	2,488,242	6.00	7.96	8.55	7.54
172	182½	165	180	155	183½	155½	230	1,320	6% cum.	100	61,657	6.00	325.62	337.65	281.22
34⅛	39	33	39¼	24¾	38	18¼	4,500	34,400	Freeport Sulphur	10	796,380	2.00	3.81	2.76	1.87
6¼	7½	6¼	10	5½	10⅞	7	1,700	9,500	Gen. Printing Ink	1	735,960	.60	.86	.94	.62
13½	14¾	12¾	19⅝	11	24⅛	14	4,500	25,300	Glidden Co.	No	829,989	1.00	1.56	1.70	—.29
42	46	40¼	45	30	47	34	800	3,700	4½% cum. pfd.	50	199.940	2.25	8.64	9.27	1.03
83	95	83	113¼	89⅞	112¾	93	500	3,900	Hazel Atlas	25	434,409	5.00	5.98	6.60	4.97
66½	77½	66	100½	69	101½	63	2,800	19,100	Hercules Powder	No	1,316,710	2.85	4.01	3.65	1.95
123½	128¼	124½	133½	126¼	135½	128½	1,440	1,930	6% cum. pfd.	100	96,194	6.00	66.38	60.87	35.31
22½	26	22¼	29	16⅝	29½	16⅝	2,200	20,000	Industrial Rayon	No	759,325	2.00	3.15	1.77	.24
20	25½	19½	47⅞	21¼	46¼	17⅛	1,300	7,400	Interchem.	No	290,320	1.60	2.47	4.10	.32
109½	113¼	109	113	91	109½	90	360	1,760	6% pfd.	100	65,661	6.00	16.99	24.27	7.39
1¼	2⅛	1¼	2½	1	3⅝	1½	1,400	20,700	Intern. Agricul.	No	436,048	...	...	—1.32	—0.003
30⅛	49	30⅛	44	18⅛	41	16	800	14,700	7% cum. pfd.	100	100,000	...	...	1.26	7.01
26	28½	23⅜	38⅞	19⅝	55¾	35	68,000	269,600	Intern. Nickel	No	14,584,025	2.00	2.30	2.39	2.09
40½	41¼	38¼	39⅝	26⅞	38	29	800	4,500	Intern. Salt	No	240,000	2.50	3.98	1.92	2.29
18⅜	20¼	18⅝	23¾	14⅝	22½	14½	800	3,600	Kellogg (Spencer)	No	509,213	1.60	...	1.39	.71
32⅛	45⅜	31	53⅝	30	56⅝	36½	14,700	71,100	Libbey Owens Ford	No	2,513,258	3.50	3.97	3.21	1.57
13⅝	16⅝	13	18⅝	10⅛	19	13⅛	2,900	15,500	Liquid Carbonic	No	700,000	1.00	1.72	1.62	1.81
24¾	30	24¼	32¾	21	37⅝	20¾	2,200	14,400	Mathieson Alkali	No	828,171	1.50	1.72	1.12	1.01
80	88½	77	119	79	114¾	85¾	4,800	29,200	Monsanto Chem.	No	1,241,816	3.00	4.04	3.81	2.35
113	117	112	119	110	121	110	340	1,430	4½% pfd. A.	No	50,000	4.50	57.38	54.29	31.51
117¼	120	115	122	113½	122½	112	130	1,310	4½% pfd. B.	No	50,000	4.50	57.38	54.29	31.51
15	17¾	14½	22½	14⅛	27½	17⅞	15,100	67,700	National Lead	10	3,095,100	.87	1.34	1.23	.75
172	176	172	176	160	173⅛	152	300	2,000	7% cum. "A" pfd.	100	213,793	7.00	28.54	27.04	20.03
145	154	144½	153¾	132	145	132	150	740	6% cum. "B" pfd.	100	103,277	6.00	59.46	55.30	35.97
26⅜	31	26	44	28¾	46	28½	1,100	13,400	National Oil Products	4	179,829	1.35	3.92	3.89	2.23
5½	8¾	5⅝	14¼	6⅛	17¾	8½	9,100	36,100	Newport Industries	1	621,359	.30	.50	.66	—.08
39½	49¼	40	64⅝	42	70	50	11,700	59,400	Owens-Illinois Glass	12.50	2,661,204	2.00	2.71	3.17	2.02
51¾	58¼	51¼	71¾	53	66	50⅝	12,600	54,200	Procter & Gamble	No	6,409,418	2.75	4.37	3.80	2.50
116½	119½	116¼	118½	112½	119⅝	112	180	1,220	5% pfd.	100	169,517	5.00	336.78	298.55	101.81
12¾	13⅛	10⅛	13⅛	7⅝	17¼	9⅞	24,200	74,300	Shell Union Oil	No	13,070,625	.75	1.05	.77	.70
25⅝	26	18⅞	23¼	12¼	29½	15½	14,300	27,600	Skelly Oil	No	981,349	1.25	3.28	1.90	2.27
28⅛	28¾	25½	29	20¾	30	22¾	50,700	195,100	S. O. Indiana	25	15,272,020	1.50	2.20	2.24	1.82
34½	36½	33	46½	29⅞	53½	38	97,500	439,500	S. O. New Jersey	25	26,618,065	1.75	...	3.27	2.86
7⅝	9⅛	7⅝	9¼	4⅛	9⅛	4	4,700	26,300	Tenn. Corp.	5	853,696	.25	1.36	.41	.40
37⅜	40¼	34½	47⅝	33	50¾	32½	48,100	204,900	Texas Corp.	25	10,876,882	2.00	...	3.02	2.13
31⅞	38	31½	37¼	26⅞	38½	26	10,000	55,900	Texas Gulf Sulphur	No	3,840,000	2.50	2.38	2.04	1.81
64⅞	70⅞	60	88⅝	59⅞	94¼	65½	38,000	167,300	Union Carbide & Carbon..	No	9,277,288	2.30	4.55	3.86	2.77
41¾	50½	41¾	65⅝	42½	69½	52	1,900	10,500	United Carbon	No	397,885	3.00	3.36	3.81	3.78
21	28¾	20	28	14	29⅝	13½	3,300	32,500	U. S. Indus. Alcohol	No	391,238	...	...	.20	—1.08
24⅞	34⅛	23	43⅞	25	40	16	13,600	44,500	Vanadium Corp. Amer.	No	377,140	1.50	...	3.25	.61
21	24¾	20	31½	19	29⅝	18¼	1,000	6,200	Victor Chem.	5	696,000	1.40	1.45	1.59	1.05
1½	2½	1½	4⅛	1¾	5⅝	2⅛	4,600	11,800	Virginia-Caro. Chem.	No	486,122	...	...	—1.57	—1.80
20	27¼	19⅛	31¾	14	33¾	17	2,300	11,300	6% cum. part. pfd.	100	213,052	...	...	2.41	1.90
27¾	36	27½	38½	27¾	39¼	15¼	1,600	4,500	Westvaco Chlorine	No	353,152	1.85	2.96	2.91	1.52
108¼	110¼	105	109⅞	108	...	...	450	2,200	cum. pfd.	No	60,000	4.50	...	...	...
NEW YORK STOCK EXCHANGE															
35¼	38	31	39⅞	26	35¾	18⅝	30,200	103,800	Amer. Cyanamid "B"	10	2,618,387	1.10	2.44	2.07	.91
117	134	117	134⅞	98	112¾	76	900	6,300	Celanese, 7% cum. 1st pfd.	100	148.179	9.72	35.25	35.73	8.95
4⅜	5½	4	6¾	2⅝	6¾	3	1,200	8,900	Celluloid Corp.	15	194,952	...	—.29	.70	—2.73
...	...	...	7¾	2	7⅝	4⅛	...	...	Courtauld's Ltd.	£1	24,000,000	.16	...	4.92%	.26%
7	7¾	6⅝	8⅛	5	9¼	5	400	4,700	Duval Texas Sulphur	No	500,000	.75	1.16	1.25	.71
67	77¾	65	92	60	68	30	500	3,100	Heyden Chem. Corp.	100	125.497	3.00	...	5.98	2.07
78	96¼	76¼	104	65	117	90	2,600	17,900	Pittsburgh Plate Glass	25	2,188,040	5.00	6.30	4.94	3.00
65⅛	80⅛	65¼	106	62½	113½	81	3,200	16,550	Sherwin Williams	25	638.927	3.00	...	5.96	2.43
112	115½	109	114¾	106	116	106½	240	1,260	5% cum. pfd.	50	132,189	5.00	...	35.08	8.76
PHILADELPHIA STOCK EXCHANGE															
164	182	164	192	158¾	179	135	350	1,200	Pennsylvania Salt	50	150,000	9.00	...	10.52	6.29

Price Range April 1941 Last	April 1941 High	April 1941 Low	1940 High	1940 Low	1939 High	1939 Low	Sales April 1941	Sales 1941	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
104	104½	100¾	105¼	100⅛	103⅝	98	108,000	633,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
32	35	31½	41	27½	41½	19	48,000	198,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
26½	33½	25⅝	39⅝	27	37	21½	52,000	316,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
31	38	31	40	21	30	18	.....	3,000	Ruhr Chem.	1948	6	A-O	1,500,000
97	99¾	94¾	100¼	93½	95⅝	88¾	169,000	1,833,000	Shell Union Oil	1954	2½	J-J	85,000,000
104¼	106½	103⅝	107	101⅛	106¼	97⅝	128,000	66,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104¼	105⅝	103	107	100⅝	106½	94¼	143,000	870,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
104½	106⅞	102⅞	108¼	102	105⅞	95¼	105,000	493,000	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.

New Trade Marks of the Month

RAPIDOLE 386,363
MONOBATH 386,454
SABO 386,456
STANCO 415,013
LOXAIR 424,561
PICCO 429,914
MOTH-AWAY 432,545
BURRO 434,377
WALVET BONDED 434,898
CIBAZOL 435,817
GREAT -SEAL- 436,325
APP-L-SET 426,423
BORYSLAW SYNTHETIC OZOKERITE 436,847
PLIOSHEEN 437,063
GATOR ROACH HIVES 437,274
Dupli-Color 437,999
DARI-GEL 438,149
TUBE-LOY 438,232
KLER-RO 438,281
PM 438,449
CRECOR 438,510
SOROMINE 438,540
Lakeseal 438,795
TEX-O-DOR 438,935
PERMACEL 438,986
Maxol 439,062
LOOSOL 439,130
SURGE 439,187
LAXITE 439,307
I.V.C 439,344
PYROFLEX 439,363
ALOX 439,423
ALOX 439,424
DU PONT 439,460
TARNEX 439,595
DYAL 439,669
DYPHENITE 439,670
Niagara 439,739
BESIXIN 439,787

Trade Mark Descriptions†

386,363. Warwick Chemical Co., West Warwick, R. I.; Dec. 4, 1940; for chemical products used for the dyeing and finishing of all fibers, yarns and fabrics as well as leather and paper; since Jan. 1, 1935.

386,454. The Photo Technical Corp., South Norwalk, Conn; Mar. 5, 1940; for developer and fixer for films; since Feb. 14, 1940.

386,456. Peter J. Soban (Sabo Chemical Products) Chicago, Ill; Aug. 31, 1940; for laundry bleach, disinfectant, liquid ammonia, liquid insect spray and roach powder; since May 14, 1934.

415,013. The Standard Chemical Works Co., Columbus, Ohio; Jan. 19, 1939; for souring and bluing compounds; since Oct. 1, 1928.

424,561. Steele & Bartell, Inc., Atlanta, Ga.; to Loxair, Inc., Fulton County, Ga.; Oct. 14, 1939; for chemical composition for repairing punctures; since Apr. 15, 1939.

429,914. Pennsylvania Industrial Chemical Corp., Clairton, Pa.; Mar. 23, 1940; for coal tar derived products; since Feb. 1, 1925.

432,545. O-Cedar Corp., Chicago, Ill.; May 31, 1940; for insecticide; since Mar. 4, 1940.

434,377. "Sominar", Sociedad Minera Argentina, Sociedad Anoima, Buenos Aires, Argentina; July 26, 1940; for tungsten minerals; since April, 1940.

434,898. The Cleveland Cleaner and Paste Co., Cleveland, Ohio; Aug. 12, 1940; for wall paper cleaner; since July 15, 1940.

435,817. Society of Chemical Industry in Basle, Basel, Switzerland; Sept. 9, 1940; for medicinal preparation for the treatment of infectious diseases; since Mar. 7, 1940.

436,325. The Styron-Beggs Co., Newark, Ohio; Sept. 24, 1940; for chemicals and specialties; since Aug., 1938 on laxatives and fly spray and Jan. 1896 on all others.

436,423. The Dow Chemical Co., Midland, Mich.; Sept. 27, 1940; for preparation to control the pre-harvest drop of apples; since July 30, 1940.

436,847. Inter-America Associates, Inc., New York City; Oct. 11, 1940; for synthetic ozokerite; since Sept. 1, 1940.

437,063. The Goodyear Tire and Rubber Co., Akron, Ohio; Oct. 18, 1940; for composition containing no rubber for waterproofing fabrics; since Aug. 29, 1940.

437,274. DeSoto Chemical Co., Arcadia, Fla.; Oct. 25, 1940; for preparation to be used for the extermination of roaches, silverfish, waterbugs and crickets; since 1925.

437,999. Dupli-Color Products Co., Chicago, Ill.; Nov. 18, 1940; for ready mixed paints; since Nov. 6, 1940.

438,149. The Perma-Gel Co., Washington, D. C.; Nov. 22, 1940; for stabilizer for food products, a water absorption agent for food preparations, containing concentrated vegetable mucins, dispersed with alkaline phosphates and dextrose; since Sept. 30, 1940.

438,232. American Smelting and Refining Co., New York, N. Y.; Nov. 26, 1940; for lead alloys; since Aug. 15, 1940.

438,281. Physicians & Hospitals Supply Co., Inc., (Ulmer Pharmacal Co.) Minneapolis, Minn.; Nov. 27, 1940; for non-inflammable window and glass cleaner; since Aug. 16, 1940.

438,449. The Phosphate Mining Co., New York, N. Y.; Dec. 2, 1940; for fertilizers and fertilizer materials; since Nov. 27, 1940.

438,510. Gredag Corp., Niagara Falls, N. Y.; Dec. 4, 1940; for motor oils and graphited oils both colloidal and powdered intended for lubricating purposes; since July 3, 1940.

438,540. General Dyestuff Corp., New York, N. Y.; Dec. 5, 1940; for preparations used for softening and dressing textile materials; since Sept. 15, 1931.

438,795. Finger Lakes Chemical Co., Inc., Ithaca and Etna, N. Y.; Dec. 13, 1940; for detergents (cleaning, water softening, etc.); since June 29, 1940.

438,935. Givaudan-Delawanna, Inc., New York, N. Y.; Dec. 17, 1940; for odoriferous liquid material, odorant for textile goods; since Mar. 19, 1931.

438,986. Industrial Tape Corp., New Brunswick, N. J.; Dec. 18, 1940; for pressure-sensitive adhesive tapes; since June 7, 1932.

439,062. Max Weiss (Cleaning Specialists Co.) Philadelphia, Pa.; Dec. 20, 1940; for composition for cleaning wood, stone, metal, composition, and painted surfaces; since May 17, 1940.

439,130. Tennessee Eastman Corp., Kingsport, Tenn.; Dec. 23, 1940; for hardwood distillates used as inhibitors against sludge formation in scrubbing oils for artificial gas; since Oct. 1, 1940.

439,187. Babson Bros. Co., Chicago, Ill.; Dec. 26, 1940; for liquid fly spray or insecticide; since Feb. 22, 1940.

439,307. James J. Lax, New York City; Dec. 31, 1940; for metal cleanser in liquid and paste form; since Sept., 1935.

439,344. International Vitamin Corp., New York City; Jan. 2, 1941; for vitamin preparations, vitamin concentrates and the like; since 1929.

439,363. The Porcelain Enamel and Mfg. Co. of Baltimore (Porcelain Enamel and Mfg. Co.) Jan. 2, 1941; for porcelain enamel frits; since Dec. 13, 1940.

439,423. Alox Corp., Niagara Falls, New York; Jan. 6, 1941; for corrosion-preventing film-forming compositions in the nature of paints in liquid and paste forms, and vehicles therefor; since June 30, 1937.

439,424. Alox Corp., Niagara Falls, N. Y.; Jan. 6, 1941; for chemical compounds for improving lubricity of oils; since June 30, 1937.

439,460. E. I. du Pont de Nemours & Co., Wilmington, Del.; Jan. 7, 1941; for chemical compounds known by the generic name nylon, and more particularly described as being synthetic fiber-forming polymeric amides having a protein-like chemical structure; since Sept. 7, 1938.

439,595. The Hall-Watson Co., Inc., New York, N. Y.; Jan. 11, 1941; for rust and stain removing cleanser for metals, stone, tile, enamel, porcelain, and plumbing; since Dec. 14, 1939.

439,669. The Sherwin-Williams Co., Cleveland, Ohio; Jan. 14, 1941; for synthetic resins; since July 17, 1940.

439,670. The Sherwin-Williams Co., Cleveland, Ohio; Jan. 14, 1941; for synthetic resins; since July 26, 1940.

439,739. Niagara Alkali Co., Niagara Falls, N. Y.; Jan. 16, 1941; for chemical products; since Nov. 5, 1940.

439,787. Winthrop Chemical Co., Inc., New York City; Jan. 18, 1941; for pyridoxine hydrochloride (Synthetic crystalline vitamin B_6 hydrochloride); since Dec. 13, 1940.

† Trademarks reproduced and described include those appearing in *Official Gazette of the U. S. Patent Office*, Mar. 25 to Apr. 8, 1941.

New Trade Marks of the Month

ARCHER-DANIELS-MIDLAND 439,790
BAFLEX 439,830
LEAFLEX 439,831
ROXYN 439,832
ARAMINE 439,838
ROTOSOL 439,917
DIVERSEY EVERITE 439,929
PROTELA 439,955
NIPICIDE 439,971

CRYSTAMET 440,043
CLOPYROATE 440,064
33 440,081
NATUPLEX-B 440,136
DAXALAN 440,190
DOMOLENE 440,191
IMULARV 440,212
LARV-O-NIL 440,213
Amsol 440,216
Panacol 440,219

Takol 440,220
RIBOTHIAMIDE 440,221
PEAK BRAND 440,238
HAMIGEL 440,245
HAMIGUM 440,246
HEXAVIBEX 440,262
RAMASIT 440,329
HYPOBETA 440,343
WINATHIAM 440,344
FERSENIC 440,402

COV-O-RITE 440,458
COMBEVITA 440,475
AMOLEX 440,487
MEDICOID 440,515
WELDWOOD 440,528
CASCAMITE 440,540
ipi Everyday 440,556
Copoloid 440,560
STEARAMINE 440,590
ANHYDE 440,592

ANODIZER 440,769
S-KAPE 440,780
RULANE GAS SERVICE 440,792
FERNESIA 440,827
Norplex 440,874
BESTICK 440,894
THIXOJEL 441,036
POLYSOL 441,099
WERFULL 441,100

439,790. Archer-Daniels-Midland Co., Minneapolis, Minn.; Jan. 21, 1941; for soybean and linseed oil used in paints and varnishes;

439,830. Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.; Jan. 21, 1941; for lacquers; since Feb., 1936.

439,831. Roxalin Flexible Lacquer Co., Inc., Eizabeth, N. J.; Jan. 21, 1941; for aluminum mixing lacquers; since April, 1932.

439,832. Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.; Jan. 21, 1941; for enamels; since June, 1935.

439,838. Sharp & Dohme, Inc., Philadelphia, Pa.; Jan. 21, 1941; for substances having chemical and physiological properties; since Jan. 15, 1941.

439,917. American Mineral Spirits Co., Chicago, Ill.; Jan. 24, 1941; for mixture of low boiling liquid hydrocarbons; since Jan. 7, 1941.

439,929. The Diversey Corp., Chicago, Ill.; Jan. 24, 1941; for acid scale solvent in liquid form; since Dec. 24, 1940.

439,955. Albi Chemical Corp., New York, N. Y.; Jan. 25, 1941; for chemical compounds for impregnating fibrous, cellulosic, and textile material to make same mildew-proof; since Jan. 10, 1941.

439,971. National Antiseptics, Inc., Seattle, Wash.; Jan. 25, 1941; for therapeutic products; since Oct. 1, 1940.

440,043. The Cowles Detergent Co., Cleveland, Ohio; Jan. 28, 1941; for crystalline alkali silicate; since Nov. 23, 1940.

440,064. Soproco Inc., New Orleans, La.; Jan. 28, 1941; for boiler compound; since Jan. 7, 1941.

440,081. Beacon Chemical Corp., Philadelphia, Pa.; Jan. 29, 1941; for bleach, germicide, and disinfectant; since Nov. 21, 1938.

440,136. E. R. Squibb & Sons, New York, N. Y.; Jan. 30, 1941; for vitaminic preparations; since Jan. 23, 1941.

440,190. Dome Chemicals, Inc., New York City; Feb. 1, 1941; for medicines and pharmaceutical preparations for the treatment of the skin and scalp; since Jan. 28, 1941.

440,191. Dome Chemicals, Inc., New York City; Feb. 1, 1941; for medicines and pharmaceutical preparations for the treatment of the skin and scalp; since Dec. 1, 1940.

440,212. The Richards Chemical Works, Jersey City, N. J.; Feb. 1, 1941; for mothproofing compound; since Jan. 25, 1941.

440,213. The Richards Chemical Works, Jersey City, N. J.; Feb. 1, 1941; for mothproofing compound; since Jan. 25, 1941.

440,216. Socony-Vacuum Oil Company, Inc., New York City; Feb., 1, 1941; for liquid petrolatum; since Nov. 20, 1930.

440,219. Socony-Vacuum Oil Co., Inc., New York City; Feb. 1, 1941; for liquid petrolatum; since Nov. 20, 1930.

440,220. Socony-Vacuum Oil Co., Inc., New York City; Feb. 1, 1941; for liquid petrolatum; since Nov. 20, 1930.

440,221. E. R. Squibb & Sons, New York City; Feb. 1, 1941; for vitaminic preparations; since Jan. 27, 1941.

440,238. The Farr Co., Greeley, Colo.; Feb. 3, 1941; for lime sulfur solution used as a disinfectant and germicide; since May, 1939.

440,245. Haas-Miller Corp., Philadelphia, Pa.; Feb. 3, 1941; for gelatinous chemical used as a sizing and finishing medium in the treatment of textile fabrics; since Jan. 4, 1941.

440,246. Haas-Miller Corp., Philadelphia, Pa.; Feb. 3, 1941; for textile compounds; since Jan. 4, 1941.

440,262. Parke, Davis & Co., Detroit, Mich.; Feb. 3, 1941; for preparation containing vitamin B_6 (pyridoxine hydrochloride); since Jan. 16, 1941.

440,329. General Dyestuff Corp., New York City; Feb. 5, 1941; for colloidal dispersion suitable for water-proofing textiles; since Sept. 17, 1927.

440,343. Sharpe & Dohme, Inc., Philadelphia, Pa.; Feb. 5, 1941; for preparations for correction of metabolic deficiencies; since Feb. 3, 1041.

440,344. Sharp & Dohme, Inc., Philadelphia, Pa.; Feb. 5, 1941; for tonics, elixirs; since Feb. 3, 1941.

440,402. Anglo-French Laboratories, Inc., New York City; Feb. 7, 1941; for medicinal preparation for treatment of the blood; since Nov., 1940.

440,458. Davidson Manufacturing Corp., Chicago, Ill.; Feb. 8, 1941; for gum arabic solution; since Nov. 20, 1940.

440,475. Sharp & Dohme, Inc., Philadelphia, Pa.; Feb. 18, 1941; for vitamin compounds; since Jan. 15, 1941.

440,487. Carbide and Carbon Chemicals Corp., New York City; Feb. 10, 1941; for chemical preparations for inhibiting corrosion; since Oct. 26, 1940.

440,515. Clifford G. LaCrosse, Jr. (Maryland Colloid Co.) Baltimore, Md.; Feb. 10, 1941; for external antiphlogistic adsorbent for allaying pain and reducing inflammation, or poultice material; since Jan. 28, 1941.

440,528. United States Plywood Corp., New York, N. Y.; Feb. 10, 1941; for waterproof glue; since July 26, 1940.

440,540. The Borden Co., New York, N. Y.; Feb. 11, 1941; for dry powdered synthetic resin plastic adhesive; since Dec. 28, 1940.

440,556. Interchemical Corp., New York, N. Y.; Feb. 11, 1941; for printing inks; since April, 1937.

440,560. Miller Chemical & Fertilizer Corp., Baltimore, Md.; Feb. 11, 1941; for colloid copper fungicide; since Mar. 1, 1939.

440,590. Haas-Miller Corp., Philadelphia, Pa.; Feb. 12, 1941; for compound used for softening, filling and weighting; since Jan. 29, 1941.

440,592. J. L. Hoffman Co., Inc., Allentown, Pa.; Feb. 12, 1941; for antiseptic, foot bath, douche, etc.; since Feb. 7, 1941.

440,769. American Anode Inc., Wilmington, Del. and Akron, Ohio; Feb. 19, 1941; for aqueous dispersions of synthetic rubber compounds, both alone and in an admixture with natural rubber dispersions; since Feb. 11, 1941.

440,780. Foley and Co., Chicago, Ill.; Feb. 19, 1941; for insect repellent and sunburn preventive; since Feb. 14, 1941.

440,792. Rulane Gas Co., Charlotte, N. C.; Feb. 19, 1941; for liquefied petroleum gases; since Jan. 1, 1931.

440,827. The Wm. S. Merrell Co., Cincinnati, Ohio; Feb. 20, 1941; for acid neutralizing astrigent and hematinic; since Feb. 4, 1941.

440,874. The Norwich Pharmacal Co., Norwich, N. Y.; Feb. 21, 1941; for vitamin preparation; since Feb. 13, 1941.

440,894. United Paste and Glue Corp., New York, N. Y.; Feb. 21, 1941; for adhesives; since Feb. 5, 1941.

441,036. Roseman & Eisenberg, Baltimore, Md.; Feb. 26, 1941; for magnesium silicate suspensions; since Dec. 28, 1940.

441,099. The Marker Products Co., New York, N. Y.; Feb. 28, 1941; for chemicals for treating textile fibres; since May 1, 1940.

441,100. The Marker Products Co., New York, N. Y.; Feb. 28, 1941; for chemicals for treating textile fibres; since May 1, 1940.

U. S. Chemical Patents
Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 258

A Complete Check-List of Products, Chemicals, Process Industries

Cellulose

Process preparing cellulose ethers. No. 2,236,523. Cole Coolidge to E. I. duPont de Nemours & Co.

Process of preparing uniformly sized dry regenerated cellulose web from gel regenerated cellulose web. No. 2,236,526. Donald E. Drew to E. I. du Pont de Nemours & Co.

Process of xanthating cellulose ethers. No. 2,236,544. Robert W. Maxwell to E. I. du Pont de Nemours & Co.

Cellulose glycolic acid. No. 2,236,545. Robert W. Maxwell and Louis L. Larson to E. I. du Pont de Nemours & Co.

A transparent moistureproof heat sealable sheet wrapping material comprising a regenerated cellulose film coated with a moistureproofing composition. No. 2,236,546. James A. Mitchell to E. I. du Pont de Nemours & Co.

Method of mercerizing cellulosic material. No. 2,236,617. Robert L. Brandt to Colgate-Palmolive-Peet Company.

Process for the production of foils or films of cellulose triacetate. No. 2,236,648. Kurt Nagel, Josef Seib, Ludwig Scheffer and Karl Werner to Chemical Merketing Company, Inc.

Application of cellulose derivatives to a tubular surgical device. Nos. 2,237,218-222. Vincent J. Flynn to Wardlyn Corp.

Process forcing acid-free water through acid cakes of regenerated cellulose thread, discarding the water issuing from said acid cakes until said water issuing from said acid cakes is substantially neutral at which point said cakes are still substantially acid, and thereafter reusing the water issuing from said acid cakes for further removal of acid from said acid cakes. No. 2,237,844. Frank B. Ridgway to E. I. du Pont de Nemours & Co.

Process of stabilizing composite articles of cellulose material and neoprene by the addition of fluorides and products resulting therefrom. No. 2,238,141. Herbert W. Walker to E. I. duPont de Nemours & Company

Method for the preparation of methanol-soluble cellulose nitrate. No. 2,238,444. William H. F. Fravel to Hercules Powder Co.

Purification of alkyl ethers of cellulose. No. 2,238,714. Clarence F. Wells to E. I. duPont de Nemours & Co.

Method of bleaching cellulose ethers. No. 2,238,912. James A. McHard and Floyd C. Peterson to The Dow Chemical Co.

Method of making crimped cellulose organic derivative cut staple fibres having a high resiliency and capable, when fabricated into textile products, of retaining their resiliency and crimp under normal conditions of use resembling that of natural wool. No. 2,238,977. Wallace T. Jackson and Henry R. Childs to Eastman Kodak Co.

Precipitation of cellulose compounds. No. 2,239,753. Herbert E. Martin to Celanese Corp. of America.

Process of precipitating cellulose acetate from its acetylation solution in acetic acid. No. 2,239,782. Clifford I. Haney to Celanese Corp. of America.

Manufacture of cellulose esters containing unsaturated higher acid radicals. No. 2,241,226. Carl J. Malm and Gordon H. Hiatt to Eastman Kodak Co.

A cellulose compound containing sulfobenzoyl groups. No. 2,241,235. Gustave B. Bachman to Eastman Kodak Co.

Ceramics and Refractories

Process of increasing the sound absorptive properties of cellular glass. No. 2,237,032. Elmer H. Haux to Pittsburgh Plate Glass Co.

Method of preparing cellular glass. No. 2,237,037. William O. Lytle to Pittsburgh Plate Glass Co.

Coloring composition for imparting a permanent red color to glass which comprises a mixture of small amounts of gold halide and selenium. No. 2,237,042. Harry A. Truby to Pittsburgh Plate Glass Company.

Process of ornamenting glazed ceramic ware. No. 2,238,018. Wm. H. Earhart to the Harshaw Chemical Co.

Process of making magnesia refractories of high structural strength and great refractoriness. No. 2,238,428. Max Y. Seaton and Hugh H. Hartzell to Basic Dolomite, Inc.

Process and apparatus for bending glass sheets. No. 2,239,546. Lloyd V. Black and Gerald Z. Minton to Pittsburgh Plate Glass Co.

A refractory cement for bonding silica brick. No. 2,240,159. Otis L. Jones to the Illinois Clay Products Co.

A glass containing silica (SiO_2) 78%, alumina (Al_2O_3) 12% and calcium oxide (CaO) 10%. No. 2,240,327. Willem Elenbaas and Gottfried B. Jonas.

A glass resistant to hot, ionized alkali metal vapor when at a temperature of 300°C. No. 2,240,352. Rudolf Schmidt and Walter Hanlein to General Electric Co.

Lightweight synthetic stone and process of making it. No. 2,240,963. John W. Swezey and Paul W. Jones to Rostone Corporation.

Optical glass. No. 2,241,249. Leon W. Eberlin and Paul F. DePaolis to Eastman Kodak Co.

Method for making high temperature refractories. No. 2,241,354. Russell E. Lowe and Allen G. Griswold to Cities Service Oil Co.

Chemical Specialty

Printing ink comprising zein, a solvent for the zein, linseed fatty acids and a coloring agent. No. 2,236,521. Roy E. Coleman to The Zein Corp. of America.

Adhesive sheet and method of making. No. 2,236,527. Richard G. Drew to Minnesota Mining & Manufacturing Co.

Fungicidal composition comprising an alkali metal permanganate and ferric sulfate said sulfate acting to liberate more of the oxygen of the permanganate for fungicidal purposes than is liberated in the absence of said sulfate. No. 2,236,540. Albert S. Johnston.

A surgical suture composed of a sterilized strand of whole raw skin, substantially as described. No. 2,235,542. Clarence D. Lukens.

Abrasive article comprising a bonded abrasive article and a backing member joined to said bonded abrasive article by an adhesive containing a mixture of rubber, an isomer of rubber and a synthetic resin. No. 2,236,597. Lloyd A. Hatch to Minnesota Mining & Manufacturing Company.

Ink for carbon paper. No. 2,236,602. Samuel A. Neidich to Underwood Elliot Fisher Company.

A dental cream that contains, as an essential ingredient, a salt of the sulfuric acid ester of a fatty acid monoglyceride and that also contains a polishing agent and a flavoring material. No. 2,236,828. Fred W. Muncie to Colgate-Palmolive-Peet Company.

Process producing an edible substantially nonhygroscopic molasses food product, comprises comminuting citrus fruit residue containing its natural moisture, heating in the presence of an added and non-toxic calcium compound, removing excess moisture from said treated residue, mixing said residue with liquid molasses, and subjecting to drying to form a dried powdered material. No. 2,236,844. Emory L. Cocke and Benjamin H. Ticknor, 11½ to Commercial Molasses Corp. and ½ to Suni-Citrus Products Company.

A bread improver comprising a composition of urea and an ammonium propionate with an acid reaction corresponding to a pH of about 5. No. 2,236,867. Herbert H. Bunzell.

Composition for removing artificial hair coloring material from hair comprising a sulfonated oleaginous material containing free sulfonic acid groups as the active hair color-removing constituent and containing no free sulfuric acid. No. 2,236,970. Abraham R. Goldfarb to Lawrence R. Bruce, Inc.

A copper fungicide comprising a double salt of tri basic copper phosphate and di sodium phosphate in the form of crystals of the order of 1 to 2 microns in size. No. 2,237,045. Charles F. Booth and Herbert J. Krase to Monsanto Chemical Co.

Method of producing a blueprint coating comprises mixing a guanidine oxalate solution having a pH between 5 and 6 with a ferric oxalate solution, the proportions of guanidine oxalate and ferric oxalate being substantially stoichiometrically equivalent to ferric guanidine oxalate, and adding a soluble ferricyanide to the mixture. No. 2,237,084. Robert B. Barnes, Leonard P. Moore and Garnet P. Ham to American Cyanamid Co.

Process of acidifying liquid egg white materials preliminary to drying. No. 2,237,087. Verne D. Littlefield and Norman C. Fischer to Armour and Company.

Treatment of cereal products. No. 2,237,090. Arno R. Sasse to Standard Milling Co.

Reissue.

A normally removable and reusable adhesive tape comprising a paper backing having one side thereof coated with an adhesive which is tacky under normal atmospheric conditions, its opposite side coated with a protective coating including a waterproofing material. No. 21,762. Richard Gurley Drew to Minnesota Mining & Mfg. Co.

Process of extracting the fibrous structure from a cactus plant to recover the fibrous skeleton of the same in its intact formation. No. 2,237,295. Edwin H. Akin.

An insecticide comprising a lower alkyl ester of 3-isopropyl 6-methyl 3, 6-endoethylene Δ4-tetrahydro-phthalic acid. No. 2,237,356. David R. Merrill to Union Oil Co. of Calif.

A fat soluble colloid comprising the condensation product of lanolin with phosphorus pentoxide wherein major portion of lanolin is condensed to point of degradation or carbon formation and a phosphoric acid ester formed by esterification of a free hydroxyl radical of the lanolin. No. 2,237,441. Stroud Jordan.

Shampoo, containing as active ingredient a water soluble salt of the sulfonic esters of monoethanolamide of the cocoanut fatty acids in aqueous vehicle. No. 2,237,629. John W. Orelup.

Method sterilizing food products. No. 2,237,739. Charles L. Jones to Continental Gas Co., Inc.

Thermal insulating cement comprising a substantially neutral mineral wool, asbestos, bentonite, tri-sodium phosphate and sodium nitrite. No. 2,237,745. John R. Musgrave to the Eagle-Picher Lead Co.

Flexible and resilient cork composition unaffected by oils and fluid fuels comprising cork particles and a binder for said particles said binder comprising polyvinyl alcohol, a solvent for the polyvinyl alcohol, and a substantialy nonvolatile oil in dispersed state, said solvent being substantially incapable of dissolving said oil. No. 2,237,753. Charles Dangelmajer and Edgar S. Peierls to Resistoflex Corp.

Process for producing maple flavoring extract from ground maple wood. No. 2,237,981. Clayton J. Ellis and Ambrose H. Donaldson.

Emulsifiable wax product. No. 2,238,109. William K. Griesinger to The Atlantic Refining Company.

New cement product formed by combining through mixing and compacting and curing, dry powdered cement with a non-aqueous organic indurating liquid which as a generic group includes liquid aromatic hydrocarbons and liquid alcohols and mixtures of said liquids, to form a hard firm cement matrix. No. 2,238,540. James A. Sourwine.

Adhesive composition. No. 2,238,767. Hans F. Bauer, Jordan V. Bauer and Don M. Hawley to Stein, Hall Manufacturing Co.

A pencil lead of fired graphite and clay having a soluble colored ingredient lodged in the pores thereof, ineffective to alter the black coloration of the mark made by the lead and upon the application of a suitable liquid to yield a tell-tale indication in the form of a halo of contrasting color. No. 2,238,771. Isidor Chesler to Eagle Pencil Co., Inc.

A non-fluid composition of matter comprising a solid, water-soluble, neutral deliquescent, crystallizable salt capable of lowering the freezing point of water, a hygroscopic, normally solid, non-deliquescent colloid capable of forming a gel with water in admixture with the salt in minor proportion and a water-insoluble non-drying oil substantially non-evaporable at atmospheric temperatures in minor proportions, the composition being characterized by the fact that the water-soluble salt and the colloid retain their solid form and that oil is coated on the colloid. No. 2,238,776. Werner E. Kleinicke to The Johnson-March Corp.

Method of treating an earth or rock formation to produce a precipitate in the pores thereof by reacting therein a solution of a water soluble metal salt with an alkaline material. No. 2,238,930. Leonard C. Chamberlain and Harold A. Robinson to The Dow Chemical Co.

Insecticidal spray comprising a non-corrosive organic solvent having dissolved therein a product selected from the class consisting of the extracts of pyrethrin- and rotenone-bearing plants, and as an active toxicant and stabilizer a halo-phenoxy-alkyl-thiocyanate. No. 2,239,079. Gerald H. Coleman and Clarence L. Moyle to The Dow Chemical Co.

Insecticidal composition. No. 2,239,080. Gerald H. Coleman, Clarence L. Moyle and John E. Livak to The Dow Chemical Co.

Method of dampproofing of masonry structures and a liquid coating composition therefor. No. 2,239,126. Watstill H. Swenarton.

A pencil lead of a fired mix of graphite and clay, impregnated with an ionized sodium chloride solution. No. 2,239,142. Isidor Chesler and Dimitry Shutak to Eagle Pencil Co.

System for making ice cream. No. 2,239,165. Harry B. Adams to Cherry-Burrell Corp.

Manufacture of adhesives for the machine fabrication of laminated paper products. No. 2,239,358. James G. Vail and Chester L. Baker to Philadelphia Quartz Co.

A method of sterilizing fluid food products by heat. No. 2,239,397. Gerald C. North and Virgil C. Stebnitz and Alvin J. Alton to Beatrice Creamery Co.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 259

A permanent waving pad for imparting a wave to a pre-formed tress of hair by means of the heat of an exothermic chemical reaction. No. 2,239,410. Harry Bonat.

Iron-glass seal having nickel-iron contact prongs. No. 2,239,423. Albert W. Hull to General Electric Co.

Preservative for fish nets and lines consisting of mercuric oleate, pentachlorophenol, a wood tar binder, and a petroleum distillate solvent for the mercuric oleate, pentachlorophenol and wood tar binder. No. 2,239,455. Stanley H. Chambers to John Starr Brooks.

Method of fortifying edible flour and breakfast cereal with minerals which consists in mixing a non-ionized salt of phytic acid, selected from the group consisting of copper, iron, and manganese phytates, with the edible product in the proportion of approximately .002% to 1% by weight of the phytate salt. No. 2,239,543. John S. Andrews and Lacey H. Evans and Louis J. Huber to General Mills, Inc.

Process for the production of flour from grain. No. 2,239,563. Tage J. Klint.

Manufacture of a bituminous sound deadening composition. No. 2,239,688. Paul G. Peik to Emulsions Process Corp.

Process of producing a hard, dense and strong gypsum wallboard. No. 2,239,860. Carlisle K. Roos to United States Gypsum Co.

Process of producing light-weight porous plaster which comprises reacting in a plaster mix urea with a hypochlorite. No. 2,239,925. Ralph H. McKee and Frederick A. Hessel.

Detergent composition consisting essentially of from 35 to 90% by weight of a watersoluble alkali metal salt of a mineral acid and the balance a surface active product prepared by reacting a saturated aliphatic hydrocarbon in a liquid state at a temperature between 30°C. and 100°C. with a gaseous mixture of sulfur dioxide and chlorine and hydrolyzing the resulting product with an alkali metal hydroxide solution. No. 2,239,974. Cortes F. Reed to Charles L. Horn.

Manufacture of sound deadening composition. No. 2,240,015. Paul G. Peik to Emulsions Process Corp.

A liquid adhesive consisting in a partial polyvinyl acetal resin; a plasticizer; a solvent; and an inert, inorganic pigment, in an amount not exceeding substantially 5% by weight of the resin, which reduces the cold flow without detriment to the adhesive properties of the resin. No. 2,240,027. Frederick S. Bacon to Monsanto Chemical Co.

A mixture for coating weld rods, said mixture containing plumbago and sodium silicate in major proportion and Bentonite in minor proportion. No. 2,240,033. Arthur T. Cape and Charles V. Foerster, Jr.

Method of separating plant fibers. No. 2,240,113. Clyde R. Faulkender to Milkweed Products Development Corp.

Method of making soaped metal wool pads from fluffy metal wool. No. 2,240,135. Crosby Field and Gerald Crandall to Brillo Manufacturing Co., Inc.

A cellulose ester bronzing lacquer containing a flake-like bronze powder and a leafing agent comprising an aliphatic hydroxyamine. No. 2,240,151. Herbert L. Wampner to Commercial Solvents Corp.

Process of producing light-weight high early strength porous concrete which comprises reacting in a cement mix urea with a hypochlorite. No. 2,240,191. Ralph H. McKee.

Composition of matter adapted to be pressed and dried for the production of building material, comprising a joint precipitate of calcium sulfate and ferrous hydroxide together with a small proportion of a solid in colloidal water suspension intimately commingled with said precipitate. No. 2,240,254. Henry S. Colton.

Method of forming a phonograph record matrix which comprises preparing an original wax phonograph record, applying to said wax record a conductive powder having incorporated therein approximately .1% by weight of a fatty composition selected from the group consisting of stearic acid, oleic acid and lard, electrodepositing a layer of metal over said powder, and finally separating said electrodeposited metal layer from said wax record. No. 2,240,300. James H. Hunter to Radio Corp. of America.

An impregnating composition for cutting wheels comprising hydrogenated cotton seed oil 90% to 97%, salt 0.75% to 7.5%, sulfur 0.75% to 7.5% and a penetrating agent 0.75% to 7.5%. No. 2,240,302. Hugh H. Jones.

A dental X-ray film holder free from secondary radiation comprising a mixture of ingredients in the following approximate proportions and weight: Pure gum rubber 95%, sulfur 2½%, a reaction product of a formaldehyde and an aliphatic amine 2½%. No. 2,240,336. Raymond L. Kreider.

Method of treating animal furs which comprises subjecting the fur to a resinification agent in the presence of a catalyst at a moderate temperature and then continuing the resinification of the fur by mechanical finishing by combining at an elevated temperature. No. 2,240,388. Jose B. Calva to George W. Benz.

Water-glass cement powder and the preparation of cement mortar therefrom. No. 2,240,393. Karl Dietz to Pen-Chlor, Inc.

An ink-repellent composition for application on printing plates in an offset printing process comprising an ester of a sulfodicarboxylic acid, and water. No. 2,240,486. Charles O. Beckley to Western Electric Co.

Process of improving the physical properties of animal tissue which comprises treating the tissue with macin. No. 2,240,518. John M. Ramsbottom to Industrial Patents Corp.

Process for the manufacture of a plaster suitable for casting, moulding, trowelling, rolling, brushing or spraying, and capable of settting to a hard glossy mass amenable to working by chiselling, turning, sawing or the like. No. 2,240,529. George C. Tyce and Victor Lefebure to Imperial Chemical Industries, Ltd.

In preparation of lithographic plates, promoting the moisture-retaining capacity of a plate which is predominantly of aluminum by including a small amount of manganese in the plate. No. 2,240,732. William H. Wood to The Harris-Seybold-Potter Company.

Method of and means for curing concrete. No. 2,240,778. Caril W. Hunt to Hunt Process Co.

Packing and gasket sheet material comprising, a base sheet of a chemically vulcanized fiber, said sheet being substantially incompressible and being resistant to deterioration by oil or the like fluids, and a relatively thin coating of a compressible sealing material applied on both faces of said sheet, said sealing material being resistant to deterioration by oil or the like fluids. No. 2,240,789. Robert L. Kreuz to Wolverine Fabricating & Manufacturing Co., Inc.

Method of making binding agent for linoleum. No. 2,240,939. Abraham B. Miller to Hercules Powder Co.

Suppositories which have the properties of absorbing substantial quantities of water, and swelling on contact with aqueous fluids, said suppositories having a base containing as a principal ingredient an unctuous fatty acid ester of a fatty acid having at least twelve carbon atoms with a compound of the class consisting of polyhydric alcohols having an unbroken carbon-linked chain and having 4 to 6 hydroxyl groups and their anhydrides. No. 2,241,331. Robert S. Shelton and Louis Magid to The Wm. S. Merrell Co.

Coal Tar Chemicals

Esters of hydroxy polycarboxylic acid derivatives. No. 2,236,516. Frank J. Cahn and Benjamin R. Harris to the Emulsol Corp.

Composition which is adapted to disperse in aqueous media comprising an innocuous base ingredient and a proportion of a water-soluble to water dispersible chemical compound comprising a reaction product of an anhydride of a carboxylic acid ester of a hydroxy polycarboxylic acid and a member selected from the group consisting of partial ethers and partial esters of aliphatic polyhydroxy substance. No. 2,236,517. Frank J. Cahn and Benjamin R. Harris to the Emulsol Corp.

Preparation of organic nitrogenous base salts. No. 2,236,518. Frank J. Cahn and Morris B. Katzman to The Emulsol Corp.

Derivatives of alcohol amines. Nos. 2,236,528-2,236,529. Albert K. Epstein and Morris Katzman to The Emulsol Corp.

Sulfocarboxylic acid esters of alcohol amine derivatives. No. 2,236,530. Albert K. Epstein and Morris Katzman to The Emulsol Corp.

Preparation of sulfonic derivatives. No. 2,236,541. Morris B. Katzman to the Emulsol Corp.

Water-soluble colloids of urea aldehyde carbohydrate ether products. No. 2,237,240. Kurt Sponsel to Kalle & Co. Aktiengesellschaft.

Camphorylidene sulfanilamides and process for making same. No. 2,237,342. Joseph Ebert to the Farastan Co.

Process which comprises polymerizing acetylene to non-benzenoid polymers thereof by passing acetylene into contact with a mixture comprising sulfuric acid of at least 40% concentration and copper. No. 2,237,353. Max Lange to I. G. Farbenindustrie Aktiengesellschaft.

Production of oximes. No. 2,237,365. Paul Schlack to I. G. Farbenindustrie Aktiengesselschaft.

Hydroxyaliphatic thioammeline ethers. No. 2,237,584. Herman A. Bruson to the Resinous Products & Chemical Co.

Sterol derivatives and process of making same. Nos. 2,237,762 and 2,237,763. Russell E. Marker to Parke, Davis & Co.

Process for the intramolecular dehydrogenation of aromatic ring systems. No. 2,238,180. Eduard Moergeli, Karl Krauer and Max Bommer to Society of Chemical Industry in Basel.

Production of dihydric alcohols of the acetylene series. No. 2,238,471. Ernst Keyssner and Edwin Eichler to General Aniline & Film Corp.

Isoalloxazines and manufacture thereof. No. 2,238,874. Richard Kuhn and Friedrich Weygand and Arthur Herbert Cook to Winthrop Chemical Co., Inc.

Derivatives of amides of polycarboxylic acids. No. 2,238,901. Morris Katzman and Benjamin R. Harris to The Emulsol Corp.

Sulfonic derivatives. No. 2,238,902. Morris Katzman & Benjamin R. Harris to The Emulsol Corp.

Compounds of the cyclopentanopolyhydrophenanthrene series and process of making same. No. 2,239.012. Karl Miescher and Albert Wettstein to Ciba Pharmaceutical Products, Inc.

Organic nitrogenous compounds. No. 2,239,706. Albert K. Epstein and Morris Katzman to Emulsol Corp.

Sulfopolycarboxylic acid amides. No. 2,239,720. Morris Katzman to The Emulsol Corp.

Coatings

A coating composition comprising thallium, tin, antimony, copper, and lead in the following proportions; thallium 10%, tin 20%, antimony 5%, copper 3% and lead 62%. No. 2,236,840. James J. Scott and William P. Baria.

Method of coating a glass article with a metallic substance. No. 2,236.911. Bernard Long to Societe Anonyme des Manufactures des Glaces & Produits Chimiques de Saint-Gobain, Chauny & Cirey.

Process of coating a gelatin layer on top of a support consisting of polymerized vinyl chloride. No. 2,237,017. Kurt Thinius to Walther H. Duisberg.

Method coating wire with a vinylidene chloride composition. No. 2,237,315. John H. Reilly to The Dow Chemical Co.

Colored oxide film on metals consisting of the class of aluminum and alloys thereof and process of producing same. No. 2,237,483. Charles Graenacher and Max Matter to Society of Chemical Industry in Basle.

Coating process. No. 2,238,013. Wm. R. Collings and Harry W. Bull to The Dow Chemical Co.

Liquid coating composition. No. 2,238,243. Crayton K. Black to E. I. duPont de Nemours and Co.

Process applying a solid continuous coating to a shaped article of a synthetic polymer which is capable of being cold drawn with substantially permanent increase in length of said article, said coating being a substance incapable of being cold drawn with permanent increase in length to the extent to which said polymer is capable, and then cold drawing said shaped article beyond the extent to which said coating is capable of being cold drawn with permanent increase in length. No. 2,238,694. George DeWitt Graves to E. I. duPont de Nemours & Co.

A composition for coating material which is to be submitted to a drawing operation in the manufacture of wire, comprising a dispersion of lime and ferrous oxide in water stabilized by means of a vegetable oil soap. No. 2,238,738. Harold R. Hurd.

Coating composition more particularly adapted for lining fiber containers against sticking of asphalt or the like thereto. No. 2,238,783. Jackson H. Rollins and Walter E. Hatch.

Process of applying a graphite carbon coating to metal. No. 2,239,414. Clifford Eddison to Radio Corp. of America.

Method of producing upon a surface of a transparent article a coating having a predetermined degree of transparency. No. 2,239,452. Robley C. Williams and John E. Ruedy.

Coating of articles by means of cathode disintegration. No. 2,239,642. Wilhelm Burkhardt and Hermann Ramert and Eilhart Wehnelt to Bernhard Berghaus.

Dyes, Stains, Etc.

Azo dyestuffs. No. 2,236,618. Wilfrid H. Cliffe to Imperial Chemical Industries, Ltd.

Complex chromium compounds of azo-dyestuffs. No. 2,236,954. Fritz Straub and Peter Pieth to Society of Chemical Industry in Basle.

Production of azo colors. No. 2,237,768. John V. Scudi to E. I. du Pont de Nemours & Co.

Manufacture of azo pigments. No. 2,237,772. Harry J. Twitchett to Imperial Chemical Industries, Ltd.

Anthraquinone-benzacridone vat dyestuffs. No. 2,238,209. Wilhelm Bauer and Bernhard Bollweg to General Aniline & Film Corp.

Chromable triaryl-methane dyes. No. 2,238,215. Wilhelm Eckert, Karl Schilling, and Paul Hoffman to General Aniline & Film Corp.

Cyanine dyestuffs comprising two heterocyclic nitrogenous rings of type used in production of cyanine dyes linked together by a methenyl chain, each of said rings containing a fatty acid radicle united in w-position to the carboxyl-group of said radicle to the nitrogen atom of the

heterocyclic ring. No. 2,238,231. Oskar Riester and Gustave Wilmanns to General Aniline & Film Corp.

Azo compound and material colored therewith. No. 2,238,485. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Azo compounds and material colored therewith. No. 2,238,486. Joseph B. Dickey and John R. Byers to Eastman Kodak Co.

Azine compounds and materials colored therewith. No. 2,238,487. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Dyestuff composition. No. 2,238,855. Norman S. Cassel to Interchemical Corp.

Process for imparting to cement articles a superficial coloration. No. 2,238,858. Albert Hloch to I. G. Farbenindustrie Aktiengesellschaft.

Product obtained by condensing two moles of 4-amino-N-methylanthrapyridone with one mole of 2:6-dichloroanthraquinone which dyes cotton from the usual alkaline hydrosulfite vat in bright bluish red shades of good strength and fastness properties. No. 2,238,961. Alexander J. Wuertz and William Dettwyler to E. I. du Pont de Nemours & Co.

Hexakisazo dyestuffs and their maufacture. No. 2,239,005. Adolf Krebser to J. R. Geigy A. G.

Azomethine dyestuffs containing a heavy metal. No. 2,239,290. Hans Krzikalla and Helmut Pfitzner and Karl Schmidt to General Aniline & Film Corp.

Acid mono dyestuffs, of yellow, orange and red shade. No. 2,240,341. Henry Mirocourt and Marcel Georges Jirou to Campagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies.

Process for the preparation of pseudo-cyanine dyes. No. 2,241,237. Leslie G. S. Brooker to Eastman Kodak Co.

Sensitizing methine dyes and process for preparing them. No. 2,241,238. Leslie G. S. Brooker and Grafton H. Keyes to Eastman Kodak Co.

Azo compounds and material colored therewith. No. 2,241,247. Joseph B. Dickey to Eastman Kodak Co.

Equipment and Apparatus

Fire extinguishing unit comprising acidic and basic constituents adapted to unite in aqueous solution to produce fumes non-supporting to combustion, the acid constituent of which consists of dry crystalline sulfamic acid. No. 2,236,513. Hamilton Bradshaw to E. I. du Pont de Nemours & Co.

In an apparatus for processing chocolate in combination a container for holding a quantity of chocolate. No. 2,236,554. Kurt Wiemer to J. M. Lehmann.

A dehydrator. No. 2,236,711. Paul D. Kilbury ½ to John W. Billingsley.

Centrifuge apparatus for removing impurities from liquid lubricants. No. 2,236,769. Max Armbruster.

By-products coke oven and apparatus for operation of the same. No. 2,236,782. Paul M. Pinckard.

Gasoline tanker resistant to penetration by corrosion. No. 2,237,321. Andrew Wesley to The International Nickel Co., Inc.

Apparatus for the conversion of hydrocarbon oil by vapor phase reaction. No. 2,237,339. Luis de Florez.

Method of removing deposits from filters. No. 2,237,417. George M. Croft to Blaw-Knox Co.

Heating apparatus for hydrocarbon fluids. No. 2,237,468. Albert L. Baker to Gasoline Products Co., Inc.

Pulp dehydrator. No. 2,237,635. Walter E. Saxe to the Conveyer Co.

A waste heat and chemical recovery furnace for the treatment of waste liquid containing combustible constituents and chemicals to be recovered. No. 2,238,007. John P. Badenhausen to Day & Zimmerman, Inc.

Combined clarifier and flocculating apparatus. No. 2,238,024. Harry A. Linch to the Dorr Co., Inc.

Apparatus for separating metals and alloys. No. 2,238,155. William B. Cohen.

Glass distilling head. No. 2,238,174. Everett F. Kelm to Corning Glass Works.

An electrically heated oven for preheating moldable, thermosetting compositions. No. 2,238,378. Arthur P. Summerfield.

Apparatus for the polymerization of organic compounds in elongated shapes. No. 2,238,443. Charles M. Fields to E. I. du Pont de Nemours & Co.

Apparatus for manufacture of carbide. No. 2,238,516. Rollin M. Chatterton to Hydrocarbons Research Co.

Feedwater Heater. No. 2,238,572. Joseph F. Sebald to Worthington Pulp & Machinery Corp.

Apparatus for coating articles such as wires with liquid coating compositions. No. 2,238,575. Adalbert Alexay to General Electric Co.

Electron microscope. No. 2,238,577. Hans Boersch to General Electric Company.

Calorimetric apparatus. No. 2,238,606. Edwin X. Schmidt to Cutler-Hammer, Inc.

Apparatus for purifying casein. No. 2,238,690. Hugh P. Fell.

Apparatus for adding to a flowing stream of fluid proportional quantities of another fluid. No. 2,238,747. Georg Ornstein.

Apparatus for the direct recovery from ores of heavy metals of the nonferrous group. No. 2,238,815. Julius Lohse.

Apparatus for conducting operations involving the formation in connection with a fluid reactant of a viscose, plastic or semi-solid phase. No. 2,238,864. Malcolm F. Pratt and Carleton H. Schlesman to Socony-Vacuum Oil Co., Inc.

Constant evaporation process and apparatus. No. 2,238,935. Percy W. Gumaer.

Blasting assembly. No. 2,238,939. Harold A. Lewis and Fred R. Wilson to E. I. du Pont de Nemours & Co.

Preheating apparatus. No. 2,238,941. Povl T. Lindhard and Einar Svendsen to F. L. Smidth & Co.

Producer gas purifying apparatus. No. 2,239,181. Ernest H. Smith.

Air lift agitator. No. 2,239,194. Louis A. Fitzberald and Louis Lembeck to Western Machinery Co.

Apparatus for mechanically separating mineral mixtures. No. 2,239,216. Ernst Bierbrauer to American Lurti Corp.

Gas-volume indicating gauge. No. 2,239,221. Wm. E. Dimmock.

Cooler for cement clinker. No. 2,239,246. Robert D. Pike.

Metering device for compressed SO_2. No. 2,239,278. James A. Thomas to Esotoo Fumigation Co., Ltd.

Apparatus for maintaining a uniform pressure in a fluid pressure supply line. No. 2,239,481. Alfredo H. H. Christensen.

Attrition mill flinger. No. 2,239,497. Marshall S. Byers to Hercules Powder Co.

Apparatus for making tempered glass. No. 2,239,535. Gerald Z. Minton and Lloyd V. Black to Pittsburgh Plate Glass Co.

Sedimentation apparatus. No. 2,239,604. Viggo Harms to The Dorr Co., Inc.

Apparatus for wet-treating strip materials. No. 2,239,607. James J. Minsworth to Continental-Diamond Fibre Co.

Apparatus for the treatment of cereals, starch or the like with fluids or by heating. No. 2,239,608. Erich G. Huzenlaub and John H. Rogers.

Device for cleaning and mixing paint and the like. No. 2,239,741. John E. Schroder to Wesley E. Mellquist.

Apparatus for and method of apportioning chemical to a flow of water. No. 2,240,164. Eric Pick to The Permutit Company.

Apparatus for feeding a solid, pulverized material. No. 2,240,205. Benjamin G. Call to American Smelting & Refining Co.

Method and apparatus for evaporating sulfate residual liquor. No. 2,240,376. Borje S. Nyquist to Aktiebolaget Svenska Flaktfabriken.

Chemical reaction chamber. No. 2,240,481. Alfred A. Aicher.

Apparatus for coking coal. No. 2,240,575. Franz Puening.

Polymerizing apparatus. No. 2,240,618. James C. Harris, Jr. and George Sutherland.

Machine for manufacturing edible ice. No. 2,240,641. Willy Dummler, Kreis Schluchtern.

Apparatus for the concentration of minerals. No. 2,240,671. Gino Sborlino.

Method of distillation. No. 2,240,752. Marcel J. P. Bogart and James S. F. Carter to Heyden Chemical Corp.

Means for introducing liquid into flowing fluids. No. 2,240,808. Donald A. Sillers and Alexander Clarke.

Chemical apparatus. No. 2,240,921. Carl E. Anderson to E. I. du Pont de Nemours & Co.

Automatic control of the liquid level for evaporators. No. 2,240,952. Russell A. Hetzer to The American Laundry Machinery Co.

An apparatus for the degreasing of metal sheets. No. 2,240,989. Norman R. Hood and Samuel B. Spencer to Imperial Chemical Industries, Ltd.

Fluid metering apparatus. No. 2,241,286. Richard A. Werts to Arthur L. Armentrout, Elwin B. Hall and Virgil P. Baker.

Explosives

In preparation of priming mixtures, the method which comprises the admixing of solid ingredients comprising an oxidizing ingredient, an abrasive moist styphnic acid and moist basic lead styphnate, the mixture being maintained in a moistened condition whereby normal lead styphnate is formed by the reaction of said moist styphnic acid and moist basic lead styphnate. No. 2,239,547. Willi Brun to Remington Arms Co.

Fine Chemicals

Process for the manufacture of keto hydroxy steroids. No. 2,236,574. Heinrich Koester and Luigi Mamoli and Alberto Vercellone to Schering Corp.

Process for the manufacture of alkaline earth metal salts of gold keratinic acids. No. 2,236,921. Karl Schollkopf to Schering Corp.

Sugar derivatives of 1, 2-diamino-4, 5-dimethyl-benzenes and process for the manufacture of same. No. 2,237,074. Paul Karrer Hoffman-LaRoche, Inc.

Process of preparing aldehydo acylated ribose, and product thereof. No. 2,237,263. Richard Pasternack and Ellis V. Brown to Charles Pfizer & Company.

2-methyl-allyl-substituted malonic ester. No. 2,237,265. Horace A. Shonle to Eli Lilly and Company.

Method of preparing sulfanilamide that comprises bringing together p-chlorobenzene sulfonyl chloride, aqueous ammonia and a copper catalyst, and heating to about 150°C. No. 2,237,372. John K. Simons to Plaskon Co., Inc.

Method of producing pregnanolones which comprises partially reducing a pregnandione to convert one of the keto groups to an alcoholic group, and isolating the hydroxy ketone so obtained. No. 2,237,410. Adolf Butenandt to Schering Corp.

System for making starch and starch products. No. 2,237,561. Philo R. King and Russell D. Baker to Union Starch and Refining Co.

Production of guanidine sulfamates. No. 2,237,781. Wm. H. Hill to American Cyanamid Co.

Stable diazo compounds. No. 2,237,885. Eugene A. Markush and Mark S. Mayzner to Pharma Chemical Corp.

Manufacture of optically active menthones and menthols. No. 2,237,980. John Wm. Blagden and Walter E. Huggett.

Method of obtaining a vitaminous oil from fish tissues. No. 2,238,059. William S. Jones to E. R. Squibb & Sons.

Yellow fog inhibitor for photographic material. Nos. 2,238,631 and 2,238,632. Fritz Dersch and Newton Heimbach to General Aniline & Film Corp.

Process of purifying the gonadotropic hormone occurring in the blood of pregnant equine animals during early pregnancy. No. 2,238,868. George F. Cartland to The Upjohn Co.

Compounds of the etio-cholane series. No. 2,238,936. Friedrick Hildebrandt to Schering Corp.

Pregnendiones and a method of producing same. No. 2,238,955. Lothar Strassberger to Schering Corp.

A therapeutic composition for oral administration which comprises a sulfonamide compound having therapeutic properties and a fatty substance of the group consisting of oils, fats, and glycerides contained therein, in which the ratio of the fatty substance to the sulfonamide compound is at least 20 : 1. No. 2,238,973. David R. Climenko to American Cyanamid Company.

Treatment of photographic films and plates. No. 2,239,284. Fritz Draisbach to Hall Laboratories, Inc.

Method for purifying lactoflavin. No. 2,239,285. George E. Flanigan and George C. Supplee.

Proliferation stimulants and process of making same. No. 2,239,345. George Sperti to The Institutum Divi Thomae Foundation.

Pentadienal and process of making it. No. 2,239,491. Richard Kuhn and Colin J. O. R. Morris to Winthrop Chemical Co., Inc.

Diazo-imino compounds. No. 2,239,565. Eugene A. Markush and Julius Miller and John J. Malawista to Pharma Chemical Corp.

Preparation of iminodiacetic and aminotriacetic acids. No. 2,239,617. John C. Moore to The Dow Chemical Co.

A photographic silver halide emulsion sensitized with a quaternary ammonium salt sensitizer and containing a perhalogenate salt other than a quaternary ammonium perhalogenate. No. 2,239,699. Burt H. Carroll to Eastman Kodak Co.

Light-sensitive layer and method of making same. No. 2,239,704. Jan Hendrik deBoer, Roelof J. Hendrik Alink and Johannes J. A. Jonkers to Hartford National Bank and Trust Co.

Preparation of pregnendiones from pregnenolones. No. 2,239,742. Arthur Serini, Lothar Strassberger and Adolf Butenandt to Schering Corp.

Insecticides containing ortho, para and meta aminoacetanilides. No. 2,239,832. Lloyd E. Smith to Henry A. Wallace, Sec. of Agriculture of U. S.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 261

Process preparing an ethynyl-substituted cyclopentanopolyhydrophenanthrene which comprises reacting a cyclopentanopolyhydrophenanthrene having a keto group in the 17-position with acetylene in the presence of an alkali-metal tertiary alcoholate. No. 2,239,864. Homer E. Stavely to E. R. Squibb & Sons.

In method producing mixed ester derivative of bacteriologically formed dextran, reacting the dextran with butyl chloride to form the butyl ether derivative of dextran, dissolving the derivative of dextran in an aqueous solution of sodium hydroxide and reacting the mixture with a benzoyl halide to form the mixed ester derivative of dextran. No. 2,239,980. Grant L. Stahly and Warner W. Carlson to Commonwealth Engineering Corp.

As a new product, a mercurated halogenated ortho-phenylphenol in which mercury and a halogen are substituted on the phenol ring. No. 2,240,025. Howard Worne & John S. Pierce to Samuel Brass.

A normally-liquid suspension essentially comprising finely-divided bismuth subsalicylate, a fatty oil, and a small proportion of water. No. 2,240,036. Walter G. Christiansen and John L. Deuble to E. R. Squibb & Sons.

Stabilized ether composition comprising isopropyl ether, 5% to 30% of secondary butyl alcohol, based upon the volume of isopropyl ether and from 3 to 7 mg. of alpha naphthol per 100 cc. of isopropyl ether. No. 2,240,040. John Hooton to Standard Oil Development Co.

Method of purifying gelatin. No. 2,240,116. Eric L. Holmes to The Permutit Co.

Pituitary product and process of preparing same. No. 2,240,212. Edgar A. Ferguson, Jr.

Highly branched brominated organic acids and their esters. No. 2,240,275. Frank C. Whitmore and August H. Homeyer to Mallinckrodt Chemical Works.

Steps in the process of resolving a racemic mixture, comprising reacting a mono-menthol ester of a lower saturated dicarboxylic aliphatic acid with a racemic d-l-ephedrine mixture in a reaction solvent and separating the resulting 1-ephedrine-salt of the menthol ester of said aliphatic acid from the d-ephedrine compound. No. 2,240,318. Donalee L. Tabern to Abbott Laboratories.

Aminosulfonamido diphenyl sulfones. No. 2,240,383. James H. Williams to American Cyanamid Co.

Photographic emulsion layer containing a derivative of a hydroxyalkyl ether of a polyhydric alcohol. No. 2,240,469. Donald R. Swan and Carl G. Lindquist to Eastman Kodak Co.

Photographic gelatin layer containing a monoester of sorbitol. No. 2,240,471. Donald R. Swan to Eastman Kodak Co.

Photographic gelatin layer containing a polyglycerol monoester. No. 2,240,471. Donald R Swan to Eastman Kodak Co.

Photographic gelatin layer containing a Di-(Polyalkylene glycoxy) alkane. No. 2,240,472. Donald R. Swan to Eastman Kodak Co.

Photographic gelatin layer container a polyglycerol monoester. No. 2,240,475. Norwood L. Simmons to Eastman Kodak Co.

Photographic gelatin layer containing an ester of sulfosuccinic acid. No. 2,240,476. Norwood L. Simmons and Donald R. Swan to Eastman Kodak Co.

Pharmaceutical composition of the sulfanilamide class. No. 2,240,496. Michael N. Dvornikoff to Monsanto Chemical Co.

An apparatus for irradiating substances with ions. No. 2,240,914. Werner Schutze to Fides Gesellschaft fur die Verwaltung und Verwertung von gewerblichen Schutzrechten mit beschrankter Haftung.

In manufacture of organic sulfonates the method which comprises reacting at a temperature above 60° C. a salt of chlorosulfonic acid with a hydroxyl-free organic compound containing at least one non-benzenoid, carbon to carbon double bond. No. 2,240,920. James H. Werntz to E. I. du Pont de Nemours & Co .

Manufacture of beta-diketones. No. 2,240,934. Charles J. Krister to E. I. du Pont de Nemours & Co.

Pertussis toxin and toxoid. No. 2,240,969. Edwin F. Voigt and Sara W. Phillips to Lederle Laboratories, Inc.

Process of producing chlorinated ethers. No. 2,241,200. Heinrich Hopff to General Aniline & Film Corp.

Condensation products from butane tetracarboxylic acids and process for producing same. No. 2,241,201. Heinrich Hopff to General Aniline & Film Corp.

A new compound, a phosphite ester of an alkyl ether of an alkylene glycol. No. 2,241,244. Robert E. Conary and Harry V. Ashburn to The Tesan Company.

Industrial Chemicals

Preparation of organic nitrogenous base salts. No. 2,236,515. Frank J. Cahn and Morris B. Katzman to The Emulsol Corp.

Process comprising dissolving 174 parts caustic soda in 352 parts 50% caustic soda solution at 70° C., adding resultant to 792 parts benzene to form two layer system, adding 140 parts of granulated high alpha cellulose wood pulp board containing 0.5% of sodium isobutyrate, and agitating at 70°-90° C. until the benzene is clear and the caustic soda solution uniformly distributed throughout the cellulose. No. 2,236,533. Frederick C. Hahn to E. I. du Pont de Nemours & Co.

Manufacture of acetylene. Nos. 2,236,534-2,236,535. Rudolph L. Hasche to Wulff Process Company.

Manufacture of acetylene under modified pressure and temperature conditions. No. 2,236,555. Robert G. Wulff to Wulff Process Co.

A composition to be used in conjunction with motor fuels comprising 50% to 90% of fatty acid esters boiling over 500°F. and 50% to 10% of ester of aromatic acid boiling above 350°F. and having gum solvent properties at elevated temperature. No. 2,236,590. William J. Backoff, Norman D. Williams, John F. O'Loughlin, Harry L. Moir and John S. Yule to The Pure Oil Company.

Brominated arylaminoanthraquinone compounds. No. 2,236,672. Samuel Coffey and Frank Lodge to Imperial Chemical Industries, Ltd.

Process separating an azeotropic vapor mixture of steam, mercaptans and alkyl phenols. No. 2,236,723. David L. Yabroff and Ellis R. White to Shell Development Company.

Zein acetate in solution with 95% ethyl alcohol and one of the group of solvents consisting of butyl lactate and ethylene glycol monoethyl ether. No. 2,236,768. Collins Veatch to Corn Products Refining Company.

In process for production of viscous chlorinated hydro-carbon oils, step of chlorinating the oils produced from the condensation of olefinic gases by means of hydrolyzing metal chlorides. No. 2,236,796. Herman B. Kipper.

Method treating thick distillery slop comprising; filtering thick slop to separate coarse solids and cloudy light liquid with precipitating agent to form and separate a wet sludge and a clarified waste liquid of lowered B.O.D.; filtering the wet sludge to separate its wet solids and waste liquid constituents; and returning the wet solids to the thick slop. No. 2,236,800. Adolph W. Lissauer to Louisville Drying Machinery Company.

Method of extracting pure germ product from farinaceous stock. No. 2,236,806. Henry M. Sutton and Frank F. Wood to Reconstruction Finance Corp.

Process alkylating phenols which comprises reacting same with an olefin in presence of sulfuric acid containing small amount of boric acid. No. 2,236,811. Charles G. Dryer to Universal Oil Products Company.

Production of aromatic sulfonamides. No. 2,236,825. Joseph R. Mares to Monsanto Chemical Co.

An enamel slip of controlled stiffness having incorporated therewith at least one substance capable of reducing the stiffness of said slip and selected from group consisting of polybasic acids and acid reacting salts thereof, in a quantity ranging between 1 to 5 parts per thousand of the said slip. No. 2,236,852. Ignaz Kreidl.

Process of reactivating a reaction vessel which has become deactivated during the vapor phase nitration of saturated hydrocarbons therein. No. 2,236,905-906. Edward B. Hodge to Commercial Solvents Corp.

Production of ethylene glycol comprising reacting ethylene oxide with H_2O to 50-100°C. and under pressure sufficiently high to insure presence of a liquid phase in the reaction system in the presence of an organic iron compound formed in situ by action of at least one of the organic compounds of the reaction system on iron contact elements provided therein. No. 2,236,919. Hugh S. Robertson Harbison-Walker Refractories Company.

Process of separating thiophenols from alkyl phenols. No. 2,236,928. Samuel B. Thomas and Ben H. Cummings to Shell Development Co.

Process purifying crude mahogany sulfonates. No. 2,236,933. John A. Beck, Jr. to Pennsylvania Refining Co.

Process for the separation of substantially pure acetylene from gases boiling below acetylene. No. 2,236,963. Dale F. Babcock, Crawford H. Greenewalt and Hood Worthington to E. I. du Pont de Nemours & Co.

Separation of acetylene from mixtures. No. 2,236,964. Dale F. Babcock to E. I. du Pont de Nemours & Co.

Process of separating ethylene from acetylene which comprises rectifying the mixture under conditions such as to cause the acetylene to be separated as a liquid and the ethylene as a gas, condensing the gaseous ethylene, and returning a portion of same to the rectification system for use as reflux therein. No. 2,236,965. Dale F. Babcock to E. I. du Pont de Nemours & Co.

Process for the recovery of acetylene from admixture with components boiling above and below acetylene. No. 2,236,966. Joseph H. Balthis, Jr. and Guy B. Taylor to E. I. du Pont de Nemours & Co.

Process which comprises cracking a hydrocarbon oil under conditions conducive for the formation of acetylene. No. 2,236,978. Guy B. Taylor to E. I. du Pont de Nemours & Co.

Step in the method of manufacturing oxidized lead powder by the attrition process at a temperature above 212 degrees F. which consists in applying a plurality of small streams of water to the surfaces of the lead masses undergoing oxidation and abrasion to control the temperature thereof. No. 2,237,043. Harland D. Wilson to Prest-O-Lite Storage Battery Corp.

Method of producing water-soluble substituted phenols. No. 2,237,066. Mark Weisberg and Preston G. Slachman to Alrose Chemical Co.

An aqueous formaldehyde solution having formaldehyde content of at least 35% and which is otherwise unstable on storage at low temperatures and containing stabilizing amounts within the range of 1–10% of a compound selected from the group consisting of melamine and methylol melamine. No. 2,237,092. Robert C. Swain, Pierrepont Adams to American Cyanamid Co.

In method wherein an ether is prepared by reacting an alkali with a compound having the formula;

$R\text{-}CH_2\text{—}X$ wherein R is a member of group consisting of hydrogen and mono-valent aromatic radicals and X represents a halogen step of carrying out reaction in presence of a catalytic amount of a compound selected from class consisting of polyhydric alcohols and hydroxy ethers. No. 2,237,241. Charles J. Strosacker and Forrest C. Amstutz to The Dow Chemical Company.

Preparation of styrene oxide and derivatives thereof. No. 2,237,284. Francis N. Alquist and Cyrus A. Guss to The Dow Chemical Co.

Process for producing olefin dimers. No. 2,237,292. Richard M. Deanesly to Shell Development Co.

Titanium carbide and a method of making same. No. 2,237,503. Raymond R. Ridgway to Norton Co.

Pyrolysis of nitrogen basis. No. 2,237,541. James R. Bailey and Raymond Mahan to Union Oil Co. of California.

Process which comprises reacting a sulfur-containing organic compound with sulfur in the presence of a catalytic amount of a basic catalyst. No. 2,237,625. John F. Olin to The Sharples Solvents Corp.

Purification of crude esterification mixtures. No. 2,237,626. John F. Olin to The Sharples Solvents Corp.

Sulfurization of organic polysulfides. No. 2,237,627. John F. Olin to The Sharples Solvents Corp.

Separation of tri-ethyl amine from reaction mixtures. No 2,237,628 John F. Olin and George E. Hinds to The Sharples Solvents Corp.

Process of dewaxing hydrocarbon oils. No. 2,237,670. Leo D. Jones to The Sharples Corp.

Cyclopentyl esters of polycarboxylic acids. No. 2,237,729. Theodore W. Evans and James R. Scheibli to Shell Development Co.

A fertilizer nitrifying agent. No. 2,237,826. John C. Woodhouse to E. I. du Pont de Nemours & Co.

Process for the preparation of diolefins by catalytic dehydration of a compound selected from the group comprising the corresponding glycols and olefinic alcohols. No. 2,237,866. Henri M. Guinot to Les Usines De Melle.

In a process for liming rosin with the aid of heat, that improvement which comprises reacting slaked lime with rosin in the presence of an initiating agent which consists of a small amount of added water. No. 2,237,973. Robert E. Price and Ismond E. Knapp to Crosby Naval Stores, Inc.

Contact sulfuric acid process. No. 2,238,012. Cyril B. Clark to American Cyanamid Co.

Process for purifying crude ketone containing aldehydeic material, a secondary alcohol, water and hydrocarbon polymer higher-boiling than the secondary alcohol and capable of forming minimum boiling mixtures with the secondary alcohol and water. No. 2,238,016. Bernard M. Downey to Shell Development Co.

Substantially anhydrous solution of the ammonium salts of tall oil acids in a paraffin alcohol of one to five carbon atoms. No. 2,238,021. David W. Jayne, Jr. to American Cyanamid Co.

Method of preparing zinc silicate having a yellowish fluorescent color under cathode-ray bombardment which includes the steps of firing a zinc silicate-forming batch with an activator in a non-oxidizing gaseous atmosphere at a temperature of approximately 600°C. to 950°C., and then slowly cooling the fired material. No. 2,238,026. Wm. R. Moore to Hygrade Sylvania Corp.

Solders flux composition containing a boron fluorine addition compound of an amino alcohol. No. 2,238,068. Mike A. Miller to Aluminum Company of America.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 262

Solder flux composition containing a boron fluorine addition compound of an aliphatic polyamine. No. 2,238,069. Mike A. Miller to Aluminum Company of America.

Process for reducing the caking tendencies of hygroscopic, pulverulent compounds which absorb moisture and tend to cake when exposed to moist air, comprises mixing with such a compound finely divided, substantially anhydrous calcium citrate. No. 2,238,149. Emil Aeckerle.

Process of nitrating water-soluble sulfonic acids contained in acid sludge resulting from the sulfuric acid treatment of relatively low boiling petroleum hydrocarbons. No. 2,238,895. Kenneth M. Thompson to The Atlantic Refining Co.

Process of removing acidic impurities from hydrocarbon liquids. No. 2,238,201. Alexander L. Wilson and Harvey R. Fife to Carbide and Carbon Chemicals Corp.

Process for obtaining soluble beryllium compounds starting from ores containing beryllium. No. 2,238,206. Carlo Adamoli to Perosa Corp.

Manufacture of salts of styphnic acid by the sulfonation of resorcine with sulfuric acid. No. 2,238,210. Willi Brun to Remington Arms, Inc.

Process for the production of hydrocarbons containing more than one carbon atom in the molecule by catalytic conversion of carbon monoxide with hydrogen in a plurality of reaction systems from which the heat evolved is removed by an indirect heat exchange relation with a cooling liquid. No. 2,238,240. Gustav Wirth to William E. Currie.

Aromatic fluorine compounds. No. 2,238,242. Walter J. Balon and John M. Tinker to E. I. du Pont de Nemours & Company.

In a method of preparing secondary amines by the reaction of hydroquinone with a primary aromatic amine, the improvement which comprises carrying out the reaction in the presence of a phosphoric acid. No. 2,238,320. Albert F. Hardman to Wingfoot Corp.

Process of preparing an isolated soybean protein. No. 2,238,329. Percy L. Julian and Andrew G. Engstrom to The Glidden Company.

Process of making soluble starch. No. 2,238,339. Walter A. Nivling.

Method of treating municipal and industrial wastes containing carbon bearing material to produce valuable products therefrom. No. 2,238,367. John Mohr and Ernest Lagelbauer.

Method of producing aluminum chloride in a continuous process. No. 2,238,421. Darwin Krucoff.

Process for the froth flotation of negatively charged minerals. No. 2,238,439. William T. Bishop to Hercules Powder Co.

Mixed lauric-myristic esters and method of making same. No. 2,238,441. Ernest F. Drew.

Mixed capric-caprylic esters and method of making same. No. 2,238,442. Ernest F. Drew.

A polyvinyl ketal consisting of polyvinyl alcohol having at least 40% of the available hydroxyl groups united with 3,5-dimethyl cyclohexanone. No. 2,238,447. Sidney C. Overbaugh to E. I. du Pont de Nemours & Co.

Method of purfying magnesia base waste sufite pulp liquor containing calcium impurities and combustible organic matter from a cyclic process for the manufacture of pulp. No. 2,238,456. George H. Tomlinson.

Process for making olefin oxides. No. 2,238,474. Raymond W. McNamee and Charles M. Blair to Carbide & Carbon Chemicals Corp.

An aqueous emulsion coolant for use in metal working that includes an alkylolamine ester of a higher fatty acid and a dispering agent. No. 2,238,478. Emil Ott to Hercules Powder Co.

In process for treating gaseous mixtures having substantial content of acetylene therein as well as olefine and impurity contents, the steps to improve the gaseous mixture which comprise subjecting the mixture to treatment for the removal of heavy impurities, compressing the mixture to between 10 and 40 atmospheres, scrubbing with a liquid absorbent that removes carbon dioxide and then treating the resultant with dimethyl phthalate for removing the acetylene. No. 2,238,490. Rudolph L. Hasche to Eastman Kodak Co.

Apparatus for precipitating zein from its solution and recovering the zein, as a solid, in a finely divided state. No. 2,238,590. Anthony C. Horesi, Amos H. Flint and Lloyd C. Swallen to Corn Products Refining Co.

Process of precipitating zein from its solution. No. 2,238,591. Anthony C. Horsei, Amos H. Flint, and Lloyd Clayton Swallen to Corn Products Refining Co.

Cathode comprising a metalllic conductive core, an intermediate layer of anhydrous barium hydroxide on said core and a surface layer of electron emissive material on said barium hydroxide. No. 2,238,595. John W. McNall to Westinghouse Electric & Manufacturing Co.

Method inhibiting corrosive effect on ammoniacal ammonium nitrate solutions upon ferrous materials comprises adding to such solutions a small quantity of thiourea, in sufficient amount to substantially prevent corrosion. No. 2,238,651. Frank G. Keenen to E. I. du Pont de Nemours & Co.

Recovery of fluorspar from ores thereof. No. 2,238,662. Nathaniel L. Shepard to Aluminum Co. of America.

Process for the preparation of organic compounds of silicon having all four valences of the silicon attached through carbon. No. 2,238,669. Richard H. Wiley to E. I. du Pont de Nemours & Co.

Method of treating a well and increasing production thereof which comprises introducing into a well a readily hydrolyzable substance, selected from the group consisting of the amides, esters and salts of hydroxy group-, acyloxy group-, and alkoxy group-containing lower fatty acids. No. 2,238,671. John C. Woodhouse to E. I. du Pont de Nemours & Co.

Conversion of carbon oxides into higher hydrocarbons. No. 2,238,726. Walter Feisst and Otto Roeien to Hydrocarbon Synthesis Corp.

Process of producing hydrocarbons by reacting carbon monoxide with hydrogen in the presence of a hydrogenation catalyst. No. 2,238,766. Leonhard Alberts to Hydrocarbon Synthesis Corp.

Method of synthesizing sulfur-bearing, high molecular weight hydrocarbons. No. 2,238,790. Lloyd L. Davis, Bert H. Lincoln and Gordon D. Byrkit to Continental Oil Co.

Process of alkylating hydrocarbons. No. 2,238,802. Joe A. Altshuller and David H. Putney to Stratford Development Corp.

Process for the condensation of zinc vapors. No. 2,238,819. Pierre Neve.

An intermolecular dehydrohalogenation product of two different primary monoacylhalides. No. 2,238,826. John C. Sauer to E. I. du Pont de Nemours & Co.

Reissue—Neutralization of acids exuding from silicous cements. No. 21,779. Joseph H. Schlesinger to Eagle Chemical Co.

Process for halide preparation. No. 2,238,896. Mortimer M. Gibbons.

A borated alginate composition. No. 2,238,906. Jean K. Martell and Joseph W. Schaller to Fitger California Co.

Derivatives of amines. Nos. 2,238,927 to 2,238,929. Frank J. Cahn and Benjamin R. Harris to The Emulsol Corp.

Process for the preparation of naphthazarin intermediate. No. 2,238,938. David X. Klein to E. I. du Pont de Nemours & Co.

Condensation products from high molecular weight carbocyclic ketones. No. 2,238,940. Adrian L. Linch and Viktor Weinmayr to E. I. du Pont de Nemours & Co.

Process of modifying the electrochemical properties of shaped articles. No. 2,238,949. Paul Schlack to Walther H. Duisberg.

Process for the preparation of naphthazarin intermediate. No. 2,238,959. Myron S. Whelen to E. I. du Pont de Nemours & Co.

Treatment of gases containing sulfur. No. 2,239,000 Walter Henry Groombridge & Ronald Page to Celanese Corp. of Amer.

Saccharification of wood. No. 2,239,095. Rudolph L. Hasche to Eastman Kodak Co.

Process of purifying soap stock from the alkali refining of vegetable and animal oils containing protein and other unsaponifiable impurities. No. 2,239,131. Benjamin H. Thurman to Refining, Inc.

Process for the production of monomethylol butanone which comprises reacting dimethylol butanone with methyl ethyl ketone in the presence of barium hydroxide. No. 2,239,232. Hendrik W. Huyser to Shell Development Co.

Process for manufacture of cyclic ketones. No. 2,239,250. Robert Robinson.

Aldehyde reaction products with nitrogen-containing methylene compounds. No. 2,239,441. Gaetano F. D'Alelio to General Electric Co.

Process for the removal and recovery of solvent remainders from liquids, particularly of selective solvents from hydrocarbon oils and the like. No. 2,239,470. Friedrich Schick to Deutsche Erdol-Aktiengesellschaft.

Terpene-cyanoacyl compound and methods of producing same. Nos. 2,239,495 and 2,239,496. Joseph N. Borglin to Hercules Powder Co.

As an improved wax modifier a product having the general formula $R\text{-}O(CH_2)_n\text{-}ArR'$, in which R is an alkyl radical, n is an integer, Ar is an aromatic radical and R' represents at least one aliphatic hydrocarbon chain of at least 10 carbon atoms. No. 2,239,515. Jeffrey Hobart Bartlett and Melvin F. Fincke to Standard Oil Development Co.

A reducing sugar solution for use in the silvering of mirrors comprising a water soluble organic acid selected from the group consisting of acetic, citric and tartaric acids, an aliphatic alcohol and a reducing sugar. No. 2,239,519. Alexander G. Gurwood to Pittsburgh Plate Glass Co.

Improved wax modifying agent comprising a polymer of a phenolic ester having a relatively long chain of carbon atoms containing a reactive group. No. 2,239,533. Louis A. Mikeska to Standard Oil Development Co.

Stable rosin acid, rosin ester, and rosin product containing them and a method for their production. No. 2,239,555. Elmer E. Fleck and Samuel Palkin.

Continuous process of treating oils. No. 2,239,692. Otho M. Behr to Vegetable Oil Products Co., Inc.

Process for refining animal and vegetable oils. No. 2,239,701. Benjamin Clayton and Walter B. Kerrick and Henry M. Stadt to Refining, Inc.

Method of refining animal and vegetable oils containing free fatty acids. No. 2,239,747. Benjamin H. Thurman to Refining, Inc.

Process which comprises reacting acetylene with a carboxylic acid in the presence of a mercury compound of acetylene disulfonic disulfuric acid. No. 2,239,763. Walter J. Toussaint to Carbide & Carbon Chemicals Corp.

Process for production of alkaline metal silicates. No. 2,239,880. Daniel B. Curil, Jr. to Philadelphia Quartz Co.

Wetting agent resulting from the reaction of triethanolamine. No. 2,239,997. Albert K. Epstein and Morris Katzman to The Emulson Corp.

Cashew nut shell liquid which has been transformed by the substitution of a hydrocarbon radical for hydrogen of phenoilc hydroxyl groups in cashew nut shell liquid. No. 2,240,034. Solomon Caplan to The Harvel Corp.

Polymerization of cashew nut shell liquid and products thereof. No. 2,240,038. Mortimer T. Harvey and Frederick M. Damitz to The Harvel Corp.

Mixture of hydroxylated aromatic compounds obtained by the hydroxylation of polyphenyl hydrocarbons having boiling points in excess of the boiling point of diphenyl, said hydrocarbons being produced by the pyrolysis of benzene. No. 2,240,073. Russell L. Jenkins to Monsanto Chemical Co.

Method of making a drying oil suitable for use alone or in admixture with vegetable drying oils, comprising heating at a temperature between approximately 100° and 300°C. and in the presence of an acid of phosphorus a hydrocarbon polymer obtained by polymerization of an unsaturated hydrocarbon and separating therefrom a liquid distillate having an iodine number of at least 100. No. 2,240,081. Charles A. Thomas to Monsanto Chemical Co.

Liquid fuel for compression ignition engines containing a small amount of heteropolymeric ketone peroxides obtained by oxidizing a mixture of at least 2 ketones of different molecular sizes one of which is acetone. No. 2,240,145. Franz R. Moser to Shell Development Co.

Method of extracting oil from mammalian and fish viscera. No. 2,240,232. Harden F. Taylor and Robert H. Bedford to The Atlantic Coast Fisheries Co.

A process of preparing hypochlorous acid. No. 2,240,342. Irving E. Muskat and George H. Cady to Pittsburgh Plate Glass Co.

Preparation of hypochlorous acid. No. 2,240,344. Irving E. Muskat and George H. Cady to Pittsburgh Plate Glass Co.

Continuous method of chlorinating a chromium bearing ore containing in excess of 10% chromium. No. 2,240,345. Irving E. Muskat to Pittsburgh Plate Glass Co.

Process heating tall oil with sufficient alkaline material to neutralize carboxylic acids therein, in an inert atmosphere and in the substantial absence of air and liquid water, to a temperature above the melting point of the resulting substantially anhydrous soap, while passing an inert gas therethrough whereby volatile, non-saponified materials are vaporized. No. 2,240,365. Emil E. Dreger to Colgate-Palmolive-Peet Co.

Liquid composition for fluid pressure systems, comprising a substantially completely acetylated ester of a hydroxy fatty acid and an alcohol the acetylization being at a hydroxyl group that was not in a carboxyl group and also comprising diacetone alcohol and diethylene glycol mono ethyl ether. No. 2,240,437. Ivor M. Colbeth to The Baker Castor Oil Co.

Method of producing a continuous extruded mass of solid water ice. No. 2,240,463. Peter Schlumbohm.

Process of preparing cyclopropane which comprises reacting a compound of the group consisting of trimethylene dibromide and trimethylene chlorobromide with a metal reduction agent in the presence of an alkali. No. 2,240,513. John M. Ort to E. R. Squibb & Sons.

Process of preparing cyclopropane which comprises reacting trimethylene dibromide with a metal reduction agent in an essentially-aqueous reaction medium containing a small portion of an alkali. No. 2,240,514. John M. Ort to E. R. Squibb & Sons.

Manufacture of organic condensation products. No. 2,240,583. William J. Sparks and Donald C. Field to Standard Oil Development Co.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 263

Process of filtration utilizing porous cements. No. 2,240,622. Walter E. Lawson to E. I. du Pont de Nemours & Co.

Process for the production of chlorine and nitrogen peroxide. No. 2,240,668. Donald L. Reed to Henry A. Wallace, Secretary of Agriculture of U. S.

Process for the catalytic oxidation of ketones. No. 2,240,714. John J. Owen to Standard Oil Development Company.

Extraction of phenolic compounds from mineral oils. No. 2,240,727. Hans G. Vesterdal to Standard Oil Development Co.

Process for the preparation of pentaerythritol comprising the condensation in aqueous media of formaldehyde and acetaldehyde to pentaerythritol in the presence of a fixed alkali and an aliphatic acid amide containing not more than 5 carbon atoms. No. 2,240,734. Joseph A. Wyler to Trojan Powder Co.

Distillation of vinyl aromatic compounds. No. 2,240,764. Robert R. Dreisbach and James E. Pierce to The Dow Chemical Co.

Method of rectifying a gaseous mixture which includes subjecting the gaseous mixture to a preliminary rectification and to a final rectification, and utilizing in vapor form the more volatile product of the final rectification to liquefy vapor from the preliminary rectification. No. 2,240,925. William L. DeBaufre.

In a process for stabilizing sulfur trioxide so that it will remain liquid at ordinary temperatures, the step comprising adding sulfur trioxide to anhydrous acetic acid, the amount of the acetic acid being sufficient to stabilize the sulfur trioxide. No. 2,240,935. Maurice Lepin to Society Rhodiaceta.

Dehydroabietic acid derivatives. No. 2,240,936. Edwin R. Littmann to Hercules Powder Co.

Process for avoiding and rendering harmless the precipitates of water insoluble metal salts. No. 2,240,957. Ferdinand Munz to General Aniline & Film Corp.

Process treating mixture of about 60% ortho monochlortoluene and about 40% para monochlortoluene to separate at least one of said ingredients of said mixture substantially free from the other ingredient, which includes continuously distilling the mixture in a column still having the equivalent of at least 45 plates under an applied pressure of not exceeding 200 mm. absolute, and with a reflux ratio of not less than 12½:1. No. 2,240,962. Philip D. Hammond and Robert W. Harris to Heyden Chemical Corp.

Process for production of nitrogen-substituted amino methylene ketones. No. 2,240,965. Johannes A. vanMelsen to Shell Development Co.

Flotation separation of minerals. No. 2,240,976. Alfred L. Blomfield and Bunting S. Croker to Lake Shore Mines Ltd.

Process for resolving petroleum emulsions. No. 2,241,011. Melvin De Groote and Bernhard Keiser to Petrolite Corp., Ltd.

Method of increasing the efficiency of the cyclic method of oxidizing ethylene catalytically. No. 2,241,019. Floyd J. Metzger to U. S. Industrial Alcohol Co.

Method of continuously distilling mixtures of phenolic compounds whose boiling point curves are relatively close at low absolute pressures and tend to converge at higher pressures, into separate products of a purity obtainable only at absolute pressures beyond the range of conventional apparatus. No. 2,241,110. Marcel J. P. Bogart and James S. F. Carter to The Lummus Company.

Suspension for lubrication and other purposes comprising a continuous phase of oil and a disperse phase of highly disintegrated asphaltic pyrobitumen particles. No. 2,241,143. Ferdinand Kuster.

Method of distilling monomeric polymerizable substances. No. 2,241,175. Carl E. Barnes to Norton Co.

Process for obtaining a tanning agent from waste sulfite liquor. No. 2,241,306. Max Honig to Wilhelm Feith.

Preparation of polyamides. No. 2,241,321. Paul Schlack to I. G. Farbenindustrie Aktiengesellschaft.

Process for preparing polyamides from cyclic amides. No. 2,241,322. William E. Hanford to E. I. du Pont de Nemours & Co.

Process for preparing polyamides. No. 2,241,323. Crawford H. Greenewalt to E. I. du Pont de Nemours & Co.

Leather

A composite leather substitute comprising a foundation formed of a plurality of coextensive layers of heavy woven fibrous material united by a rubber deposit from latex, a facing of flock adhesively secured to one side of said foundation and a layer of latex impregnated paper adhesively secured to the other side of the foundation to add rigidity to said composite material. No. 2,239,245. Leo E. Oliner.

Metals, Alloys

Method of producing silicon steel sheet or strip. No. 2,236,519. Victor W. Carpenter to The American Rolling Mill Company.

Method of coloring metals and product. No. 2,236,549. Van M. Darsey, John S. Thompson and Edwin W. Goodspeed to Parker Rust-Proof Co.

Steel containing tellurium. No. 2,236,716. Morgan J. R. Morris to Republic Steel Corp.

Method of alloying calcium with magnesium which comprises incorporating molten magnesium with a calcium base alloy containing from 18 to 23 per cent magnesium. No. 2,236,831. Charles E. Nelson to The Dow Chemical Company.

A nickel chromium alloy containing 0.34% of a metal of the alkaline earth group, approximately 0.01% of boron, approximately 20% of chromium, the balance nickel. No. 2,236.899. Erich Fetz to Wilbur B. Driver.

A corrosion-resistant copper-zinc alloy. No. 2,236,975. Wolf J. Muller and Moritz Niessner to Aktiengesellschaft Dynamit Nobel Pressburg.

Process for recovery of a binary ferro-alloy and of magnesium from a ternary ferro silicon alloy and a magnesia containing material. No. 2,237,011. Ernst A. Pokorny to "Electrometal."

Method for purifying tinny leads and lead-tin alloys. No. 2,237,129. Gustave E. Behr to National Lead Company.

In an electrical device containing mercury metallic members exposed to the said mercury and united together by a brazing alloy containing at least 12% and less than 40% manganese, the remainder of said alloy being nickel. No. 2,237,184. Eugene Lemmers to General Electric Co.

Method of making corrosion resistant phosphor-bronze strip. No. 2,237,243. Richard A. Wilkins to Revere Copper and Brass, Inc.

Process of making cadmized bearings. No. 2,237,314. Paul E. Queneau and Albert M. Hall to The International Nickel Co., Inc.

Process for the deoxidation and degasification of steel. No. 2,237,485. Paul Hardt to Rochling'sche Eisenund Stahlwerke Gesellschaft mit beschrankter Haftung.

Process improving properties of silicon copper-base alloy. No. 2,237,774. Maurice L. Wood to Chase Brass & Copper Co., Inc.

Method of making sponge iron powder. No. 2,237,867. Cecil A. Mann to General Motors Corp.

Nickel base alloy and method of heat treating. No. 2,237,872. Frank S. Badger, Jr. to Haynes Stellite Co.

Production of ferrochromium. No. 2,238,078. Percy H. Royster.

Process of treating aluminous material to produce alumina. No. 2,238,103. Golin G. Fink and Vincent Salvatore de Marchi.

Method of making nickel-chromium alloys. No. 2,238,160. Ernest F. Doom to Electro Metallurgical Company.

Process for the recovery of tin from an ore poor in tin in a single operation and as a volatile compound. No. 2,238,194. Urlyn C. Tainton.

Process of purifying molybdenite concentrates. No. 2,238,250. Charles H. Curtis to Miami Copper Co.

Formation of ferrous metal powders and formation of articles by sintering. No. 2,238,382. Alfred L. Boegehold to General Motors Corp.

Bronze welding electrode. No. 2,238,392. Milan A. Matush to Ampco Metal Inc.

A bearing formed of an alloy capable of being rolled into sheet form from cast ingots and having high antifriction properties and fatigue resistance, said alloy consisting of aluminum and cadmium not over approximately 5%. No. 2,238,399. Alfred W. Schluchter to General Motors Corp.

Process for recovering indium. No. 2,238,437. Clarence Zixchkau to American Smelting & Refining Co.

Method and means of recovering metalliferous values. No. 2,238,448. Mervin A. Packard and Henry D. Henricksen.

Process treating iron ores containing titanium and phosphorus which consists in subjecting ore to leaching by dilute acids in presence of hydrogen peroxide, whereby phosphorus is dissolved from the ore and maintained in solution in the leaching agent. No. 2,238,586. Charles V. Foerster.

Alloy comprising from a small but effective amount up to 5% of cobalt, from a small but effective amount up to 5% of iron, from .05% up to 10% of lead, and the balance substantially all copper. No. 2,238,592. James M. Kelly to Westinghouse Electric & Manufacturing Co.

Process for the treatment of titanium containing iron ores. No. 2,238,673. Ragnvald Asak to Christiana Spigerverk.

Method of treating austenitic steel consisting of, immersing the same in a solution including tin chloride and nitric acid, and heating the same to a temperature of approximately 180°F. No. 2,238,778. Vincent T. Malcolm to The Chapman Valve Manufacturing Co.

A nickel plating bath. No. 2,238,861. Rudolf Lind, William J. Harshaw and Kenneth E. Long to The Harshaw Chemical Co.

Method of condensing magnesium vapor. No. 2,238,908. Thomas H. McConica to The Dow Chemical Co.

Recovery of magnesium from vapor phase mixtures. No. 2,238,909. Thomas H. McConica and Thomas Griswold, Jr. to The Dow Chemical Co.

Recovery of magnesium from vapor mixtures. No. 2,238,910. Thomas H. McConica to The Dow Chemical Co.

Method producing welded joint between aluminum and copper and flux for same. No. 2,239,018. Wm. M. Rogerson to Aluminum Co. of America.

Hard metal alloy. No. 2,239,058. Robert W. Schlumpf to Hughes Tool Company.

An alloy containing .1 to 3% tellurium, .1 to 10% chromium, balance copper. No. 2,239,179. Franz R. Hensel and Earl I. Larsen to P. R. Mallory & Co., Inc.

Method of purifying molten aluminum containing at least one of the impurities antimony, bismuth lead, and tin, comprising adding sodium to the melt, allowing the sodium to react with the impurities to form a dross, and finally removing the dross from the melt. No. 2,239,277. Philip T. Stroup to Aluminum Co. of America.

Separation of metals by distillation. No. 2,239,370. Wm. H. Osborn and Sidney B. Tuwiner to Phelps Dodge Corp.

Separation of metals by distillation. No. 2,239,371. Wm. H. Osborn, Sidney B. Tuwiner and Ernest O. Sperr to Phelps Dodge Corp.

Welding rod consisting of 0.08 to 0.11% carbon, 1.2 to 1.4% manganese, 0.55 to 0.75% chromium, 0.25 to 0.35% molybdenum and remainder iron, said rod giving a welding line having a tensile stress of 70 to 80 kg./mm., the material constituting said welding line being resistant to the customary hardening thermal treatments. No. 2,239,465. Agostino Nepoti.

Recovery of nickel and copper from nickel-copper mattes. No. 2,239,626. Helmut Schlect and Leo Schlect to I. G. Farbenindustrie Aktiengesellschaft.

Thermal treatment for aluminum base alloys. No. 2,239,744. Dana W. Smith and William L. Fink to Aluminum Co. of America.

Process for production of porous metal bodies which comprises forming a body of the finely divided metal introducing a metal salt into the formed body in the form of a solution thereof and reducing the metal salt to metal in situ. No. 2,239,800. Hans Vogt and Ernst Klotz.

Process for treating liquid zinc amalgams. No. 2,239,869. Hermann Wolf, Ernst Kuss, Hans Hohn and Fritz Steitzel to Duisburger Kupferhutte and I. G. Farbenindustrie Aktiengesellschaft.

Alloys for metal to glass seals. No. 2,240,063. Victor O. Allen and Charles P. Marsden to Wilbur B. Driver Co.

Alloy for metal to glass seals. No. 2,240,064. Victor O. Allen and Charles P. Marsden to Wilbur B. Driver Co.

An alloy consisting essentially of, approximately aluminum 8 to 11%, nickel 0.5 to 1.5%, iron 0.1 to 0.7%, copper balance, the amount of nickel being at least twice the amount of iron. No. 2,240,202. Carlo Anselmi.

Method of continuously tin plating ferrous metal stock. No. 2,240,265. John S. Nachtman.

Method of forming anti-friction surfaces which comprises heating copper and lead together in the molten state in the presence of lithium vapor until agitation of the alloy occurs and applying to the article to be surfaced said molten alloy, to coat said article. No. 2,240,313. Harold J. Ness.

Method of forming a sound, pipeless metal casting. No. 2,238,405. Augustus B. Kinzel to Elevyto Metallurgical Co.

Roofing comprising sheet copper presenting an extensive external roofing surface, the copper being alloyed with approximately 0.02% to 1.5% arsenic, the balance of the alloy in respect to the arsenic being essentially copper. No. 2,240,447. Richard A. Wilkins to Revere Copper & Brass, Inc.

An aluminum base alloy comprising 3% to 5% copper, 1% to 2.5% nickel, less than 1% silicon, .8% to 1.6% zinc, about .35% to about 2.2% magnesium, with the balance substantially all aluminum. No. 2,240,489. Walter Bonsack to The National Smelting Company.

Process for the production of magnesium metal from oxidic magnesium compounds by thermal reduction with the aid of calcium carbide. No. 2,240,584. Robert Suchy and Hellmuth Seliger to Magnesium Development Corp.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 264

Welding rod. No. 2,240,672. Robert Scherer, Gerhard Riedrich and Hans Hougardy to Deutsche Edelstahlwerke Aktiengesellschaft.

Method of concentrating low grade oxidized iron ores. No. 2,240,718. Le Roy E. Schiffman, Claude Sims Lawson and Joseph T. Blakemore.

Method of making metallic magnesium of high purity from impure magnesium. No. 2,240,817. Fritz Hansgirg to American Magnesium Metals Corp.

Method of producing iron anodes. No. 2,240,821. John L. Young to Plastic Metals Inc.

Aluminum alloy. No. 2,240,940. Joseph A. Nock, Jr. to Aluminum Company of America.

Alloy steel. No. 2,241,187. Ralph P. De Vries to Allegheny Ludlum Steel Corp.

Improvements in the process for working gray cast iron containing more than 1.5% carbon, comprising heating the alloy to 950° to 1150°C. and above, and hot rolling the said alloy in this state. No. 2,241,270. Heinrich Nipper to The Timken Roller Bearing Company.

Low temperature impact resistant steel. No. 2,241,369. Nicholas A. Ziegler and Homer W. Northrup to Crane Company.

Paints and Pigments

A paint comprising thermoprene, cashew nut shell oil and a liquid carrier which dries by evaporation. No. 2,237,024. Richard A. Crawford to The B. F. Goodrich Company.

Process for the manufacture of pigments having a lead chromate base. No. 2,237,104. Norman F. Livingston to The Sherwin-Williams Company.

Process preparing cadmium sulfide pigments which comprises reacting cadmium nitrate and a barium sulfide in aqueous solution and adjusting the pH of the precipitate to between 7 and 8.8. No. 2,237,311. James J. O'Brien to The Glidden Co.

Manufacture of zinc sulfide pigment. No. 2,237,755. Zoltan deHorvath and William B. Paris to The Eagle-Picher Lead Co.

Production of rutile pigment. No. 2,237,764. Robert M. McKinney to E. I. duPont de Nemours & Co.

Method of flushing water wet pigments in oil. No. 2,238,275. Thomas A. Martone to E. I. du Pont de Nemours & Co.

Carbonaceous pigment and process of manufacture. No. 2,238,576. George L. Heller and Carl W. Snow to General Atlas Carbon Co.

Reissue—Method for production of carbon black. No. 21,781. Harry A. Toulmin, Jr. to The Soren Corp.

A paint suitable for application to hot metal surfaces. No. 2,239,478. Linton C. Amberson.

Method of drying a water wet pigment powder. No. 2,239,492. Byron Marquis to Interchemical Corp.

Method of producing titanium dioxide suitable for use as a pigment which comprises subjecting vaporized titanium halide to thermal decomposition by means of oxygen within a reaction chamber and minimizing crystal formation by maintaining the titanium halide vapor out of substantial contact with hot surfaces within the chamber during the major portion of said decomposition. No. 2,240,343. Irving E. Muskat to Pittsburgh Plate Glass Co.

Paper and Pulp

Method for making coated paper. No. 2,237,068. Donald B. Bradner to The Champion Paper and Fibre Company.

Method of bleaching kraft pulp. No. 2,239,606. Edward H. Hill and Ralph Hooks to West Virginia Pulp & Paper Co.

Substantially dry composition particularly adapted for sizing paper-making stock and comprising substantially dry rosin size particles enveloped by substantially dry, acidic, calcined starch-conversion product having a dextrin content downwards of about 60% and substantial solubility in water at 70°F. No. 2,239,814. Earle R. Edson and Charles Quincy to LePage's Inc.

Process for producing white mechanical wood pulp from pine wood. No. 2,240,017. Otto Primavesi.

Process in the manufacture of paper, cellulose, ground wood-pulp, carton and other fiber products consisting of adding an aluminum compound to the white water having a pH-value between 4 and 6 and adding a sufficient amount of a sulfonated oil to said white water in the presence of said metallic compound for flocculating the solid particles in said water to enable the reclaiming thereof for reuse. No. 2,240,403. Adolf M. R. Karlstrom.

Aqueous paper coating composition comprising emulsified wax and rosin size in a weight ratio between about 3:1 and about 1:2 on a dry basis, an amount of protein representing between about 1/5 and about 1/33 of the combined weight of wax and rosin size, an amount of water sufficient to provide a dispersion containing between about 0.5 and about 10 per cent by weight of the foregoing mixture of wax, rosin size and protein, and starch in an amount representing between about 1 and about 6 per cent by weight of the entire composition. No. 2,241,174. Calvin L. Bachelder to Hercules Powder Co.

Petroleum

Revivification of decolorizing absorbents. No. 2,236,679. Robert P. Ferguson and Frederick W. Schumacher to Standard Oil Development Company.

Process for dewaxing hydrocarbon oils. No. 2,236,765. Earl Petty to Sun Oil Company.

A lubricating oil having a viscosity index of over 90 comprising principally an ether of the type ROR' where R is a high molecular weight aliphatic radical having at least 13 carbon atoms and R' is an organic radical containing at least one cyclic nucleus. No. 2,236,896. Lloyd L. Davis, Bert H. Lincoln and Gordon D. Byrkit to Continental Oil Company.

A lubricating oil having a viscosity index of over 90, comprising principally an ether of the type RXR' where R is a high molecular weight aliphatic radical having at least 13 carbon atoms, R' is an organic radical containing at least one cyclic nucleus and X is an atom of an element selected from the right-hand side of group VI of the periodic table. No. 2,236,897. Loyd L. Davis, Bert H. Lincoln and Gordon D. Byrkit to Continental Oil Company.

Lubricant comprising a major proportion of an oil of lubricating viscosity and a minor proportion of an organo-metallic compound containing more than one metallic atom but no metal-to-metal bonds. No. 2,236,910. Bert H. Lincoln, Gordon D. Byrkit and Waldo L. Steiner to Continental Oil Company.

Lubricating composition comprising lubricating oil, approximately 3% thereof or less of an additive substance containing phosphorus for maintaining the lubricating property of said oil under high pressure, and approximately one or two per cent or less of ethylene dichloride. No. 2,236,915. Fred Norton to the Ohio Oil Company.

Lubricant containing in solution an alkaline earth salt of a sulfurized monocarboxylic acid to inhibit oxidation. No. 2,237,096. Frederick E. Dearborn.

Method of distillation. No. 2,237,271. George S. Dunham to Socony-Vacuum Oil Company, Inc.

Manufacture of oxidized petroleum acid compounds. No. 2,237,301. Robert E. Burk & Everett C. Hughes to The Standard Oil Co.

Method of treating well bore walls. No. 2,237,313. Carl F. Prutton to The Dow Chemical Co.

Process treating hydrocarbon gas having components of different volatility. No. 2,237,386. Samuel C. Carney to Phillips Petroleum Co.

Process for coking residual hydrocarbon oils. No. 2,237,414. Roland B. Day to Universal Oil Products Co.

Conversion process for hydrocarbon oils. No. 2,237,432. Lyman C. Huff to Universal Oil Products Co.

Processes for converting normally gaseous olefins into normally liquid hydrocarbons. No. 2,237,459. Ralph B. Thompson to Universal Oil Products Co.

Heating apparatus adapted for heating hydrocarbon fluids. No. 2,237,502. John H. Richerman to Gasoline Products Co., Inc.

A lubricating composition containing a lubricating oil and at least 0.5% by weight thereof of benzothiazol tetrasulfide. No. 2,237,526. Robert L. Humphreys to Standard Oil Co. of California.

Method of improving lubricating properties of a hydrocarbon lubricating oil comprises incorporating in the oil a small proportion of an alkylated triphenyl phosphate in which each alkyl group contains ten or more carbon atoms. No. 2,237,632. Herman E. Ries, Jr. to Sinclair Refining Co.

Anti-knock motor fuel containing an aliphatic mono-ester having two branched alkyl terminals and containing 7–12 C atoms in the molecule with oxygen present only in the ester linkage. No. 2,237,660. Carleton Ellis to Standard Oil Development Co.

Grease containing asphalt. No. 2,237,682. Lester W. McLennan to Union Oil Co. of Calif.

Method converting olefinic hydrocarbons to hydrocarbons of higher boiling points by polymerization thereof. No. 2,237,822. Edwin T. Layng to The Polmerization Process Co.

Method for detecting the presence of excessive quantities of a relatively lower boiling liquid in a relatively higher boiling liquid. No. 2,237,824. Edward G. Ragatz to Union Oil Co. of Calif.

Process for refining pressure distillate. No. 2,238,429. David G. Brandt to Cities Service Oil Co.

Method increasing cetane number of a petroleum Diesel oil fraction comprises treating said Diesel oil fraction with a diazonium salt at temperatures below about 40° F., in proportion sufficient to form diazonium salt reaction products in said Diesel oil fraction and to increase the cetane number, neutralizing the resulting mixture, and separating the water containing the dissolved salts of reaction from the Diesel oil fraction containing the diazonium salt reaction products in solution. No. 2,238,553. Marvin L. Chappell to Standard Oil Co. of California.

Catalytic treatment of hydrocarbons. No. 2,238,594. Boris Malishev to Standard Oil Development Co.

Improved oil composition consisting of an insulating hydrocarbon oil and a soluble condensed polynuclear hydro-aromatic compound having a molecular weight above about 200, having the property of lowering the viscosity index of the oil and lowering the gas evolution of the oil under the influence of an electric discharge. No. 2,238,637. Peter J. Gaylor to Standard Oil Development Co.

Lubricant and method of manufacturing same. No. 2,238,638. Anthony H. Gleason to Standard Oil Development Co.

Method of recovering oil from oil and gas bearing sands. No. 2,238,701. Burton McCollum to McCollum Laboratories, Inc.

Process of improving lubricating oils. No. 2,238,846. Carl Clar and Paul Kuhnel to Ruhrchemie Aktiengesellschaft.

Process for the conversion of natural gasoline hydrocarbons to high octane motor fuel hydrocarbons. No. 2,238,860. Lebbus C. Kemp to The Texas Co.

Method of treating hydrocarbon oil to form therefrom low boiling hydrocarbons suitable for motor fuel. No. 2,239,490. Wayne E. Kuhn to The Texas Co.

Stable drilling fluid comprising a suspension of an oxide of lead in a petroleum oil to which has been added at least one per cent by volume of a fatty acid. No. 2,239,498. George E. Cannon and Milton Williams to Standard Oil Development Co.

Improved process for increasing the stability of hydrocarbon polymers comprises partially decomposing a mixture of linear substantially saturated hydrocarbon polymers which are oil soluble and contain unstable constituents of relatively high molecular weight, whereby the unstable constituents are broken down to products of lower molecular weight. No. 2,239,501. Per K. Frolich and Floyd L. Miller to Standard Oil Development Co.

A drilling fluid for drilling through heaving shale. No. 2,239,647. Allen D. Garrison to Texas Company.

Method of lubrication. No. 2,239,752. Arthur W. Lewis to Tide Water Associated Oil Co.

Method of converting a hydrocarbon oil boiling predominantly between 200°F. and 750°F. into high quality gasoline by catalytic cracking. No. 2,239,801. Vanderveer Voorhees to Standard Oil Co.

Method lubricating bearing surfaces with lubricant containing oil-soluble organic morphaline derivative in corrosion inhibiting proportions. No. 2,239,841. Elmer W. Cook to Tide Water Associated Oil Co.

Method of refining hydrocarbon oils containing sulfur compounds. No. 2,239,859. Elmer H. Records and James E. Louttit.

Liquid lubricating oil composition comprising a petroleum lubricating oil and chloro calcium phenyl stearate in which the chlorine is attached to the calcium. No. 2,239,953. Matthew Fairlie to Sinclair Refining Co.

Improved steps in process where hot vaporous products resulting from pyrolytic conversion of hydrocarbon oils and containing substantial quantity of materials boiling within range of gasoline ore fractionated to condense therefrom fractions boiling above range of gasoline. No. 2,239,965. Lyman C. Huff to Universal Oil Products Co.

Method treating hydrocarbon fluids. No. 2,240,008. Harold V. Atwell to Process Management Co.

Mineral oil composition and improving agent. No. 2,240,009. Darwin E. Badertscher to Socony-Vacuum Oil Co., Inc.

Process for refining and improving the quality of a lubricating oil. No. 2,240,054. Roger W. Richardson to Standard Oil Development Co.

Process for treating petroleum fractions to produce therefrom substantial yields of essentially paraffinic motor fuel having relatively high antiknock value. No. 2,240,134. Gustav Egloff to Universal Oil Products Co.

Process cracking residue oils in the vapor phase. No. 2,240,160. William Kaplan to Cities Service Oil Co.

Catalytic conversion system employing moving catalyst beds in a plurality of vertical tubes. No. 2,240,347. James M. Page, Jr. and Vandeveer Voorhees to Standard Oil Co.

U. S. Chemical Patents

Off. Gaz.—Vol. 525, Nos. 1, 2, 3, 4, 5—Vol. 526, No. 1—p. 265

Process of producing normally liquid gasolinelike hydrocarbons from normally gaseous hydrocarbons. No. 2,240,433. Harold V. Atwell to Process Management Co., Inc.

Process for treating hydrocarbons to produce motor fuels. No. 2,240,434. Harold V. Atwell to Process Management Co., Inc.

Process of separating and recovering constituents of petroleum products which comprises intimately contacting a petroleum product in liquid form with an alkyl ester of citric acid, under circumstances permitting development of a two-phase liquid and separating the two phases by gravity. No. 2,240,577. Raphael Rosen and Charles A. Cohen to Standard Oil Development Company.

Nitrated diesel fuel and process of making same. No. 2,240,558. Carleton Ellis to Standard Oil Development Co.

Composition of matter comprising a solid iso-olefin polymer of high molecular weight. No. 2,240,582. William J. Sparks to Standard Oil Development Company.

Process for dewaxing mineral oils which comprises mixing said oil with nitromethane, chilling the resulting mixture to precipitate wax, and removing the precipitated wax from the oil-solvent mixture. No. 2,240,964. Sijbren Tijmstra and Donald S. McKittrick to Shell Development Company.

Method of treating an oil well to convert a water wet producing sand to one which is preferentially wettable by oil. No. 2,241,253. Allen D. Garrison to The Texas Company.

Method of treating oil wells. No. 2,241,254. Allen D. Garrison to The Texas Company.

Oil base drilling fluid. No. 2,241,255. Allen D. Garrison to The Texas Co.

Method of and apparatus for treatment of drilling mud. No. 2,241,273. William W. Robinson and Robert R. Crippen to The Texas Co.

Storage and dispensing system for liquefied hydrocarbons. No. 2,241,278. Wilmer B. Spivey.

Resins, Plastics

Method of inlaying articles molded from a synthetic resin compound which comprises heating the surface of the article being ornamented through the intermediation of the ornament being inlaid, and tapping said ornament during the heating operation to force it against the surface of the article to embed it therein. No. 2,237,152. James J. Larmour to Plastic Inlays, Inc.

Method preparing acetone formaldehyde resins capable of setting without evolution of gas. No. 2,237,325. Emil H. Balz to Plaskin Co., Inc.

Phenol modified resins and process for their preparation. No. 2,237,634. Raphael Rosen to Standard Oil Development Co.

Vinylidene Chloride Copolymer. No. 2,238,020. Alden W. Hanson & Wm. C. Goggin to The Dow Chemical Co.

Co-polymers of convertible esters. No. 2,238,030. Theodore F. Bradley to American Cyanamid Co.

Thermoplastic protein material. No. 2,238,307. George H. Brother and Leonard L. McKinney to Secretary of Agriculture of U. S.

Sheet material for thermoplastic shoe stiffeners, comprising in its composition approximately 130 parts rubber, 400 parts resin-containing box toe scrap, 100 parts cumarone resin and 200 parts asbestos fibre. No. 2,238,337. Harold S. Miller to Beckwith Mfg. Co.

Process for opacification of resins. No. 2,238,446. Glen M. Kuettel to E. I. du Pont de Nemours & Co.

Resinous reaction product of formaldehyde and the product obtained by reacting a polymide-forming composition and an excess of polymide-forming reactant of the class consisting of a diamine and a dibasic carboxylic acid in the presence of a phenol containing a carbonamide-forming group complementary to the amide-forming group contained in said polyamide-forming reactant, said polyamide-forming composition comprising reacting material selected from the class consisting of monoamino-monocarboxylic acids and mixtures of diamine with dibasic carboxylic acid. No. 2,238,640. William E. Hanford to E. I. du Pont de Nemours & Co.

Polymeric reaction product of amides with monovinyl acetylenes. No. 2,238,682. Harry B. Dykstra and Ralph A. Jacobson to E. I. du Pont de Nemours & Co.

Process of making a soluble, rapid-drying resinous complex. No. 2,238,684. Carleton Ellis to Ellis-Foster Co.

Resin complex soluble in organic solvents comprising a neutralized saccharide-urea-formaldehyde resin and a polyhydric alcohol-polycarboxylic acid reaction product condensed therewith in butanol solution. No. 2,238,685. Carleton Ellis to Ellis-Foster Co.

Manufacture of sheets or films of artificial material. No. 2,238,730. Otto Hauffe to Walther H. Duisberg.

Subdivided magnetic core with polystyrene binder. No. 2,238,893. Ernst Fischer to Siemens & Halske Aktiengesellschaft.

Vinyl resin emulsion. No. 2,238,956. Corneille O. Strother to Carbide & Carbon Chemicals Corp.

Process of forming a plastic composition comprises adjusting the hydrogen ion concentration of rubber latex to a value between 11.1 and 11.4 pH, and then mixing therewith a cement selected from the group consisting of aluminous cement and Portland cement to form a pasty mass. No. 2,238,975. John T. K. Crossfield.

Resinous composition comprising the product of reaction of an aliphatic aldehyde and malonic diamide. No. 2,239,440. Gaetano F. D'Alelio to General Electric Co.

Polymerization and condensation products of phenol sulfides. No. 2,239,534. Louis A. Mikeska and Eugene Lieber to Standard Oil Development Co.

A transparent, self-sustaining film comprising polyvinyl alcohol, an amino polymer which is substantially insoluble in water and in 5% aqueous ammonia, but which is soluble in 2% aqueous acetic acid and in toluene, a moistureproofing agent, and a plasticizer. No. 2,239,718. Emmette F. Izard to E. I. du Pont de Nemours & Co.

Process for improving the properties of shaped articles substantially consisting of polyvinyl chloride which have been prepared by simultaneous action of heat and pressure which comprises heating the said shaped articles without using pressure to temperatures of between 220 and 320°C. No. 2,239,780. Hans Fikentscher and Heinrich Jacque to General Aniline & Film Corp.

Process of producing a rubbery, gelled synthetic resin by reacting a terpene with maleic anhydride, distilling off the volatile portion to separate a non-volatile residue, and heating the said non-volatile residue with a glycol for a period of time sufficient to reach the gelled state. No. 2,240,006. Ernest G. Peterson to Hercules Powder Co.

Method for producing urea-formaldehyde resins. No. 2,240,271. Walter Scheib to Bakelite Gesellschaft nit beschrankter Haftung.

Process of making a heavy duty, non-dimensional change molding composition of resinous character. No. 2,240,480. Edward R. Dillehay to The Richardson Co.

Solutions of polyvinyl alkyl ketones and a process of polymerizing vinyl alkyl ketones. No. 2,240,730. Arthur Voos and Kurt Billig to General Aniline & Film Corp.

Process of decorating plastics. No. 2,240,900. Charles A. Bauer to The Cardinal Corp.

Curing of synthetic resin films. No. 2,241,225. Ralph H. Talbot to Eastman Kodak Company.

Process for preparing a polyvinyl acetal resin containing a hydroxyl group content equivalent to not more than about 15% by weight of polyvinyl alcohol and an acetate group content equivalent to not more than about 5% by weight of polyvinyl acetate. No. 2,241,234. Gustave B. Bachman to Eastman Kodak Co.

Method of forming a volatile solvent-free colored thermoplastic molding composition. No. 2,241,251. Ernest M. Franklin to Eastman Kodak Co.

As a new composition of matter, a composition of hydrogenated coumarone-indene resin, from about 1 to 40% of a rubber-like isobutylene polymer, and a solvent, said composition being productive of clear films. No. 2,241,340. William H. Carmody to The Neville Co.

Rubber

Neutralization of rubber hydrochloride cements and products made therefrom and process pertaining thereto. No. 2,237,125. Charles W. Walton to Wingfoot Corp.

Process vulcanizing rubber which comprises heating rubber and sulfur in presence of a benzothiazyl thio aryloxy-acetate admixed with a guanidine accelerator as an activator thereof. No. 2,237,769. Robert L. Sibley to Monsanto Chemical Co.

Method vulcanizing rubber. No. 2,238,331. Joy G. Lichty to Wingfoot Corp.

Method producing condensation derivative of rubber. No. 2,238,336. Thomas C. Morris to Wingfoot Corp.

Method of closing a package made of rubber hydrochloride film by the application of heat and pressure to the closure thereof, which comprises bringing the rubber hydrochloride film into pressure contact with a hot plate coated with a non-adhesive in forming the closure and thereby depositing the non-adhesive on the rubber hydrochloride film during the contact. No. 2,238,342. Theodore A. Riechl to Wingfoot Corp.

Method forming a rubber composition which comprises mixing rubber and carbon black, heat treating said mixture at such temperatures and for a sufficient time to cause stiffening of said mixture, adding zinc oxide, an accelerator, and sulfur, and thereafter milling said mixture and vulcanizing. No. 2,239,659. Harry P. Bradley to The Firestone Tire & Rubber Co.

Vulcanized sponge rubber having uniformly distributed microscopic cells containing water having a hygroscopic agent being incorporated therein, the hygroscopic agent being present in an amount which will retain the water in the sponge rubber but will not absorb water out of the atmosphere, whereby the sponge rubber possesses a dry surface. No. 2,240,415. Paul G. Peik to Emulsions Process Corp.

Method of adhering rubber to brass. No. 2,240,862. James W. Schade to The B. F. Goodrich Co.

Textiles

Process of dyeing a mixed textile structure composed of cellulose acetate and a material other than cellulose acetate with a dyestuff having an affinity for said other material but having substantially no affinity for said cellulose acetate material. No. 2,237,829. Winfield W. Heckert to E. I. du Pont de Nemours & Co.

Process for manufacturing artificial fiber from protein contained in soybean. No. 2,237,832. Toshigi Kajita and Ryohei Inoue to Showa Sangyo Kabushiki Kaisha.

As new article of manufacture an improved dense pile fabric comprising ground warp and weft threads and pile threads, the ground threads of which are composed essentially of synthetic linear polymide filaments, the ground threads being shrunk, in situ, in the fabric whereby to increase the denseness of the pile. No. 2,238,098. Hamilton Bradhsaw to E. I. du Pont de Nemours & Co.

Process for the production of improved textile materials, which comprises increasing the water-resistance of a knitted fabric of an organic derivative of cellulose by impregnating the fabric with a dispersion containing rubber, a wax and a soap which is a salt of a solid fatty acid and a volatile base and subsequently decomposing the soap and liberating the base by heating the treated materials. No. 2,238,165. George H. Ellis and Edmund Stanley to Celanese Corp. of America.

Process of dyeing fabric which consists in preparing an aqueous solution of a dye, raising the temperature of the dye to a point where it is converted into steam upon contact with the atmosphere, confining said heated solution under pressure greater than atmospheric pressure and forcibly discharging the heated dye by said pressure upon the fabric in the presence of the atmosphere. No. 2,238,400. Lawrence O. Scott.

A process for reducing the tendency of a textile comprising wool to shrink. No. 2,238,672. Paul Arthur, Jr., Max Theo. Goebel to E. I. du Pont de Nemours & Co.

Crease-resisting treatment of textile materials. No. 2,238,839. William Watkins.

Article of manufacture comprising a rubberized cellulose fabric impregnated with a mildewproofing agent compatible with rubber, said agent containing a fatty acid soap of cadmium as its essential active ingredient. No. 2,238,850. Martin Leatherman.

A desizing agent comprising anylase and a water-soluble organic compound. No. 2,238,862. Wilhelm Neugebauer to Kalle & Co. Aktiengesellschaft.

Textile oil. No. 2,238,882. Alfred C. Goodings, Harry B. Marshall and Herbert W. Lemon.

Fire repellent pile fabric, comprising a woven non-combustible ground fabric formed of spun warp and weft threads of non-metallic, inorganic fibers and having pile threads interlocked therewith to form a protecting pile surface overlying the non-combustible ground fabric. No. 2,239,457. Willis A. Gibbons to U. S. Rubber Co.

Apparatus for mercerizing fabric piece goods. No. 2,239,636. Ernst Weiss to Heberlein Patent Corp.

Manufacture of spinnerettes. No. 2,239,979. Max Schneider to North American Rayon Corp.

Process for producing enhanced crepe effects on fabrics containing high twist yarns having a basis of an organic derivative of cellulose. Nos. 2,240,554-555. Henry Dreyfus.

Process of conditioning yarn to render it more amenable to textile operations. No. 2,241,246. Joseph B. Dickey and James B. Normington to Eastman Kodak Co.

Apparatus for the production of artificial threads. No. 2,241,304. Alfred D. Heywood and John H. Givens and Eric A. Morton to Courtaulds.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

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Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost by E. L. Luaces, 1107 Broadway, New York.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. We expect to begin reporting German patents in the near future. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published December 10, 1940.

Process and apparatus for producing clean de-inked pulp from printed fibrous material. No. 392,980. Edward H. Partington and William H. Porritt.

Manufacture of esters by passing an olefine, an aliphatic acid and a compound of phosphorus in a disperse phase through a heated reaction zone. No. 392,992. Henry Dreyfus.

Process of solidifying and densifying a concrete mass. No. 393,010. Louis S. Wertz.

Process of obtaining rennin from animal stomachs. No. 393,017. Armour and Company. (Havard L. Keil and Betty K. Stout.)

Preparing a fluorescent material by heating together zinc oxide, silica and a small quantity of a manganese compound. No. 393,023. Canadian General Electric Company, Ltd. (Willard A. Roberts.)

Process of preparing oil in water emulsion containing a cellulose derivative, having 25-60% non-volatile content, and which is of paste-like consistency. No. 392,042. Canadian Industries Limited. (Alfred Dreyling and William W. Lewers.)

Process for extracting zinc from its sulfide ores electrolytically. No. 393,043. Canadian National Carbon Company, Limited. (Erwin A. Schumacher and George W. Heise.)

Process for depositing copper from an aqueous electrolyte containing cupric sulfate and ferrous iron ions. No. 393,044. Canadian National Carbon Company, Limited. (Erwin A. Schumacher and George W. Heise.)

Rubber composition containing prior to vulcanization a compound which is an ester of a boric acid and a monohydroxy substituted aromatic secondary amine. No. 393,066. Dominion Rubber Company, Limited. (Philip T. Paul.)

Preserving rubber and similar oxidizable substances by incorporating therein p-allyloxy diphenylamine. No. 393,067. Dominion Rubber Company, Limited. (Philip T. Paul.)

Preserving rubber by incorporating therein a methallyloxy diarylamine. No. 393,068. Dominion Rubber Company, Limited. (Philip T. Paul.)

Composition suitable for preparation of insecticidal spray emulsion comprising dinitro-cyclohexyl-phenol and a gel-forming clay. No. 393,070. Dow Chemical Company. (Sheldon B. Heath.)

Production of magnesium by thermal reduction of its oxide employing calcium carbide as the reducing agent. No. 393,071. Dow Chemical Company. (Roy C. Kirk.)

Manufacture of amino-acid amide derivatives. No. 393,080. J. R. Geigy S. A. (Henry Martin and Walter Stammbach.)

Manufacture of arsenic acid. No. 393,082. General Chemical Company. (Garnett L. Scott.)

Furnace for the production of volatilizable metals (such as magnesium) by thermal reduction. No. 393,096. Magnesium Elektron Limited. (Hellmuth Seliger, Otto Bretschneider, Bernhard Hubald, Willy Kruger and Georg Truglitzka.)

Thermal production of magnesium by reduction of a substance containing magnesium oxide with the aid of reducing agent taken from silicon, ferrosilicon and aluminum. No. 393,097. Magnesium Elektron Limited. (Hellmuth Seliger and Otto Bretschneider.)

Magnesium-gold-silver alloys. No. 393,098. P. R. Mallory & Co., Inc. (Franz R. Hensel, Kenneth L. Emmert and James W. Wiggs.)

Process of concentrating ores by gravity. No. 393,102. Minerals Beneficiation, Inc. (Henry H. Wade.)

Method of silvering mirrors. No. 393,111. Peacock Laboratories, Inc. (Ohio.) (William Peacock.)

Maintaining the temperature of the web at temperature not exceeding 75° C. in the manufacture of paper filled with alkaline filler containing calcium carbonate and rosin sizing. No. 393,115. Raffold International Corp. (Harold R. Rafton.)

Gas scrubber. No. 393,137. Western Precipitation Corporation. (Norman C. Brundage.)

Alloy comprising substantially silicon 20-50%, nickel 1-5%, copper 0.5-2.5%, magnesium 1-3%, vanadium up to 1%, antimony up to 1% and the balance aluminum and impurities. No. 393,144. Bernard B. Pelly. (Harvey G. Schwarz.)

Process for coloring cellulose ester and ether textile materials. No. 393,145. Henry Dreyfus. (George H. Ellis, Henry C. Olpin and William C. McKnight.)

Preparation of unsaturated hydrocarbons by passing hydrocarbons in gas phase through highly heated reaction chambers, adding hydrocarbons to the hot gases directly behind the zone of maximum temperature without substantially cooling them, and then quenching. No. 393,150. I. G. Farbenindustrie A. G. (Paul Baumann and Ludwig Heer.)

Production of aluminum-calcium alloys by pouring molten aluminum over molded bodies comprising ground burnt lime and powdered aluminum. No. 393,151. I. G. Farbenindustrie A. G. (Robert Suchy and Hellmuth Seliger.)

Separating an after-chlorinated polyvinyl chloride from its solution in organic solvents. No. 393,152. I. G. Farbenindustrie A. G. (Curt Schönburg.)

Reacting an alkali metal pyrophosphate, phosphoric acid, and a vitamin B_1 salt at a temperature of 100-200° C. No. 393,153. Merck & Co., Inc. (Henry Tauber.)

Method of improving the taste and odor of tea free from or poor in caffeine. No. 393,155. Theodor Grethe.

Electrolytic method of cleaning iron and steel wire, bands, etc. No. 393,156. Ferdinand A. Herrmann.

Granted and Published December 17, 1940.

Production of colored filaments, foils, straw and the like having a basis of an organic derivative of cellulose. No. 393,166. Henry Dreyfus.

Metal mixture for removing film from metal surfaces preparatory for subsequent application. No. 393,176. John L. Lehman.

Production of zinc sheet and foil by rolling zinc alloyed with a hardening metal sufficient to harden it when rolled below annealing temperature and above 80°C. No. 393,191. Urlyn C. Taintor.

Process for producing copper-base-boron alloys. No. 393,200. The American Brass Co. (Horace F. Silliman.)

Copper-base alloy comprising from 1-50% zinc, 0.01-1% boron, and the balance copper. No. 393,201. The American Brass Company. (Horace F. Silliman.)

Hot-workable copper-base alloy comprising 0.1-20% tin, 0.05%-0.50% boron, the balance copper, the boron being in solution with the tin in the copper. No. 393,202. The American Brass Co. (Horace F. Silliman.)

A powder having as its major coloring component a water insoluble azo color, a sufficient portion of the color particles being coated with an antodispersibility producing protective agent such as dextrine. No. 393,203. American Cyanamid Co. (Moses L. Crossley, Roy H. Kienle and Alfred L. Peiker.)

Rubber compounded with coal tar oil containing substantial portions of monomethyl and dimethyl naphthalene fractions and being substantially free of oil constituents boiling above about 300°C. No. 393,205. The Barrett Co. (Karl H. Engel.)

Liquid insulating composition comprising at least about 40% of chlorinated polyphenyl and about 10-40% by weight of the 1,2,3,4 isomer of tetrachlorbenzene. No. 393,211. Canadian General Electric Co., Ltd. (Frank M. Clark and Walter M. Kutz.)

Method of bonding rubber to metal including incorporating a small amount of a sulfide of phosphorus into a vulcanizable solid rubber composition. No. 393,229. Dominion Rubber Co., Ltd. (Elwood L. Scholl.)

Method of bonding rubber to metal including incorporating red phosphorus and an activator therefor into a vulcanizable rubber composition. No. 393,230. Dominion Rubber Co., Ltd. (Elwood L. Scholl and Amos Wendell.)

Production of resist effects illuminated with vat dyestuffs on fabrics composed wholly or partly of cellulosic fibre. No. 393,235. Imperial Chemical Industries Ltd. (Denys P. Milburn.)

Metallic moulding powder consisting principally of metallic particles having their surfaces roughened by the sintering thereto of other and smaller metallic particles. No. 393,240. Johnson Bronze Co. (Louis G. Klinker.)

Flotation process including the use of a thiophane reagent. No. 393,245. Minerals Separation North American Corp. (Carl F. Williams and William Trotter.)

Concentration of phosphate ore by flotation with a non-frothing organic liquid immiscible with water. Nos. 393,246 and 393,247. Phosphate Recovery Corp. (William Trotter and Eltoft W. Wilkinson.)

Electrolytic recovery of copper from scrap brass. No. 393,248. Plastic Metals, Inc. (Allen C. Jephson.)

Plasticizer comprising the reaction product of a fatty acid with a keto-aromatic group. No. 393,254. Sylvania Industrial Corp. (Ralph T. K. Cornwell.)

Producing colored artificial filaments and yarns by incorporating colloidal graphite in a spinning solution, forming filaments therefrom, and then coloring the filaments with dyestuffs. No. 393,267. Camille Dreyfus. (George Schneider.)

Dyes filaments of cellulose acetate of improved fastness to light, acid and perspiration fading carrying a small amount of hydroxide of an alkaline earth metal. No. 393,268. Camille Dreyfus. (George Schneider and William Whitehead.)

Production of calcium carbonate adapted for use as pigment in rubber. No. 393,270. Pittsburgh Plate Glass Co. (George Lynn, Arthur E. Boss and Edward M. Allen.)

Production of ethyl chloride by chlorination of ethane in the gas phase in presence of catalysts. No. 393,273. Walter Flemming, Karl Dachlauer and Erwin Schnitzler.

Foreign Chemical Patents

Canadian, English and French—p. 47

Producing vinyl chloride by leading acetylene containing mercury vapor and hydrogen chloride over active carbon. No. 393,274. Johannes Boesler, Ernst Eberhardt, Wilhelm Sandhaas and Robert Stadler.
Producing butadiene by treating vinylacetylene with amalgams of alkali metals in presence of substances which develop hydrogen with said amalgams. No. 393,275. Robert Stadler, Karl Ackermann and Erwin Lehrer.
Producing porous metal bodies by sintering powders of metal belonging to the iron group, using metal powders the pouring weight of which amounts to less than 2 kilos per liter and carrying out the sintering at temperatures above 650°C. No. 393,276. Leon Schlecht and Karl Ackermann.

Granted and Published December 24, 1940.

System for treatment of waste paper stock. No. 393,281. Arno W. Nickerson and Emil C. Gildenzopf.
Pulp screening apparatus. No. 393,292. Elijah Cowan.
Meter for measurement of granular or powdered materials. No. 393,300. James E. Lee.
Method of diminishing adhesion between a wet paper web and a metal roll in a paper-making machine. No. 393,303. Samuel Milne.
Roll for a pulp beating engine. No. 393,304. Samuel Milne.
Method of producing metal paste pigments including one of the group consisting of phenol, monobenzyl amino phenol, p-tertiary amyl phenol and guaiaphene. No. 393,314. Aluminum Co. of America. (Edwin L. McMahan.)
Method of producing metal paste pigments including one of the group consisting of alpha and beta naphthol. No. 393,315. Aluminum Co. of America. (Edwin L. McMahan.)
Method of producing metal paste pigments including one of the group consisting of alpha naphthyl amine, beta naphthyl amine, monoamyl amine, diamyl amine and triamyl amine. No. 393,317. Aluminum Co. of America. (Edwin L. McMahan.)
Dispersible diazobiguanide having the formula R-N=N-B in which R is an aromatic or heterocyclic radical free from sulfonic and carboxylic groups, and B is a biguanide radical free from substituents capable of coupling with diazo compounds and is also free from sulfonic and carboxylic groups. No. 393,319. American Cyanamid Co. (Hans Z. Lecher.)
Production of cellulose derivatives by treating cellulose with hydrogen peroxide under time and temperature control. No. 393,325. Brown Co. (George A. Richter.)
Production of wet-strengthened paper product. No. 393,326. Brown Co. (Milton O. Schur.)
Sweetening sour hydrocarbon distillate with alcoholic solution of caustic alkali and an oxidizing agent yielding hydrogen peroxide. No. 393,327. Buffalo Electro-Chemical Co., Inc. (Virden W. Wilson.)
Liquid degreasing composition comprising water-soluble tallol soap, liquid hydrocarbon grease solvent and an alkali-metal phenolate. No. 393,354. Curran Corp. (Alton F. Curran.)
Alloy having substantially 10-30% chromium, 0.2-2% columbium, not exceeding 15% iron, the remainder nickel. No. 393,361. Electro Metallurgical Co. of Canada Ltd. (Frederick M. Becket and Russel Franks.)
Purification of sulfuric acid containing contaminating nitrogen-oxygen compound impurities. No. 393,363. General Chemical Co. (William E. Watson.)
Non-aqueous neutral electrolyte including a polyhydroxy alcohol, acetic acid and ammonium hydroxide. No. 393,364. General Motors Corp. (Alexander M. Georgiev.)
Drier comprising a metallic drier salt and a small amount (about 1%) of a triethanolamine salt of a carboxylic acid. No. 393,365. The Harshaw Chemical Co. (Paul E. Burchfield.)
Rubber-like elastic composition made by dissolving an ester of a polyacrylic acid and a monohydric aliphatic alcohol of not more than two carbon atoms, treating with an agent comprising a copper compound, and separating the resulting product from the solvent. No. 393,388. Resistoflex Corp. (Ernst Schnable.)
The alpha-alkyl glycerol trinitrite of the general formula $R\text{-}CHNO_3\text{-}CHNO_3\text{-}CH_2NO_3$ wherein R. is an alkyl radical. No. 393,390. Shell Development Company. (Herbert P. A. Groll.)
Ammonium polysulfide solution having a ration of free sulfur to divalent sulfur of not exceeding 2.62 to 1 which is stable for at least twenty minutes upon dilution with 80 times its volume of water. No. 393,392. Shell Development Co. (Franz A. Horsley and Ludwig Rosenstein.)
Lubricating ferrous surfaces by applying a water solution of a compound of arsenic or antimony and then applying lubricating oil to the surface. No. 393,393. Shell Development Co. (Paul Beuerlein and Hans Seeles.)
A non-aqueous drilling fluid comprising a blown asphaltic bitumen. No. 393,394. Shell Development Co. (Reginald D. Dawson and Philippus H. Huisman.)
A catalytically-active palladium film at least 250 atoms thick possessing a surface in which the 110 plane is sufficiently oriented to yield an electron diffraction pattern consisting at least of arcs with faint rings. No. 393,395. Shell Development Co. (Otto Beeck and Frederick F. Rust.)
Manufacture of artificial sausage skins by extruding swollen fibrous masses. No. 393,424. Naturin-Werke Becker & Co. (Oscar W. Becker and Emil Braun.)

ENGLISH COMPLETE SPECIFICATIONS

Accepted and Published August 28, 1940.

Manufacture and production of butadiene. No. 524,918. I. G. Farbenindustrie A. G.
Manufacture of fluorescent materials. No. 524,802. British Thomson-Houston Co. Ltd.
Production of resinous products. No. 524,681. K. Ripper.
Marking or decorating of textile fabric. No. 524,803. Interchemical Corp.
Manufacture of hydrogen peroxide. No. 524,686. Imperial Chemical Industries Ltd.
Mercerizing and lustering of textile fibres. No. 524,805. J. Brandwood.
Anhydrite plasters. No. 524,928. Imperial Chemical Industries Limited.
Dyeing pelts, hairs, or feathers. No. 524,807. I. G. Farbenindustrie A. G.
Manufacture of resin-like condensation products. No. 524,695. I. G. Farbenindustrie A. G.
Manufacture of para-aminobenzaldehydes. No. 524,696. I. G. Farbenindustrie A. G.
Means for carrying insecticides and fumigating substances. No. 524,714. Pan Britannica Industries Ltd.
Treatment of liquid distillable carbonaceous materials containing solid matter in dispersion with hydrogen. No. 524,715. N. V. Internationale Hydrogeneerings Octrooien Mij.
Pre-gummed wallpaper, poster-paper, etc., and adhesive compositions for use thereon. No. 524,741. Stein-Hall Manufacturing Co.
Metals deposited in flake form and methods of preparing the metal in fine flake form. No. 524,744. Phelps Dodge Corp.
Liquid emulsifying apparatus. No. 524,728. British Emulsifiers, Ltd.
Device for delivering wax polishes and other like substances from containers in which they are packed. No. 524,811. Kleen-e-ze Brush Co., Ltd.
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